

Ear, nose and throat foreign bodies: A cross sectional study on incidence, clinical factors and dimensions

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ABSTRACT

Introduction: Ear, nose and throat (ENT) foreign body (FB) is common problem with significant morbidity and mortality. They are classified into organic or inorganic. Aerodigestive FBs are responsible for suffocation and death up to three years old with a 10% mortality up to 14 years old in Europe. Malaysia lacks local data that quantifies FB in dimensions to predict its risk. The study objectives were to determine the incidence of ENT FBs (paediatric and adult) in a Malaysian tertiary referral center; to determine the association between the FB types and factors contributing to its occurrence (largest dimension, volume, witnessed); to determine the treatment required; and association between hand dominance with ENT FBs.

Materials and Methods: Prospective data of all children (<18 years old) and adults (≥18 years old) seen by the ENT physicians presenting with ENT foreign body were included over 12 months at Hospital Canselor Tuanku Muhriz (HCTM) from 1st February 2017 to 31st January 2018. All cases are seen by an ENT doctor (specialist and/or medical officer) during on-call, in hospital and outpatient's referrals. FB dislodged in the lower airways (trachea, bronchus and bronchiole) and upper gastrointestinal (GI) tract (oesophagus) were included. Exclusion criteria were FB dislodged in non-ENT orifices such as the stomach and beyond with no other ENT FBs. Bias was reduced by a proforma after obtaining an informed consent and taking the average of three measurements of FB dimensions.

Results: The incidence of ENT FB within HCTM was 3.5% (overall), 1.9% (organic), 1.6% (inorganic); 1.65% (children) and 1.85% (adults). Children have a mean age of 5.34 and adults 49.35 years. Among the patient factors; children FB are often inorganic (73.95%; plastic, metal, graphite), males predominant (56.5%), unwitnessed (66.67%), witnessed incidents were by adults (69.5%) at home (91.3%). Adult FB are often organic (77.1%; fish bone, cotton, tick), male to female ratio 1.4:1; not associated with occupation. Mackerel followed by red snapper and tilapia were common fish bones ingested. Common locations of FB among children and adults were throat (35.3%), ear (32.03%) and nose (26.14%). Less than one fifth required hospitalization due to aerodigestive FBs with 6 (72.7%) of hospitalised patients suffering complications of hypoxic brain injury, lung collapse, pneumonia, esophageal perforation and lacerations. Fifty-seven (37.25%) patients (adults

predominant) required endoscopic removal under general or local anaesthesia. The side of ear and nose FB to hand dominance was significant ($p < 0.05$).

Conclusion: ENT FB are more common in the ear and nose in children; not witnessed, located in the oropharynx and occurred at home and during playtime. Organic FB and fish bones were common among adults in the Malaysian population. Aerodigestive FBs are associated with hospitalization, complications, requiring antibiotics and endoscopic intervention.

KEYWORDS:

Choking; adult; children; aspiration; epidemiology

INTRODUCTION

Foreign body (FB) within ear, nose and throat (ENT) is a common presentation to outpatient and inpatient units with significant morbidity and mortality among children and adults. Chiun et al (1) reported that there were a whopping 1084 cases of FB with 825 outpatients and 259 inpatients over a five-year span at the Sarawak General Hospital.¹

Shaariyah et al (2) reported seventy cases of FB requiring endoscopic intervention in the upper gastrointestinal tract at a tertiary centre in Kuala Lumpur, Malaysia over 9.5 years; an average of seven per annum.² FB among children is often more common compared to adults with a majority of less than five years old.¹ A 10-year data of ingested FBs in the United States showed children (90.5%) with the mean age of three were more susceptible to FB ingestion than adults.³

Although ear and nose FB often results in local symptoms, aerodigestive FB carry the highest liability in suffocation and death up to three years old with a 10% mortality from 50 000 incidents up to 14 years of age in the European Union (EU).⁴ Europe has seen an advancement with the European registry of foreign body registries i.e. Susy safe project, a multinational pan-European systematic study accessible to the public for accurate data collection and appraisal. It acts as a surveillance system and risk profiles non- food related FB.⁵

ENT FB presents in a plethora of size, shape, consistency and material. They can be divided into organic or inorganic. Food objects are more common than non-food objects, while

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causative factor among children is the lack of supervision.⁵ In Korea, ENT FB incidence among children were commoner in the throat (59.2%), followed by nose (33.4%) and ear (7.4%).⁶ A hallmark finding from Susy safe would be the discovery of elliptical FB being common in the younger age groups.⁵ FB are peculiar to the orifices they are founded. Studies from EU and Asia (India, Thailand, Malaysia) concur that spherical objects such as pearls, marbles and coins are predominant in the throat owing to their larger diameter that prevents insertion into the nose and ears. Seeds, nuts and beads are common in ears and nose.^{1,5,7-8} Malaysia lacks local data that quantifies FB in dimensions. In a nutshell, FB ingestion are preventable and is of paramount importance.

It is hypothesized that the risk ENT FB are inorganic and more common in the ear and nose among children; while organic FBs are commoner among adults. The general objective of this research study is firstly to determine the incidence of ENT FBs (paediatric and adult) in a tertiary center in Malaysia; secondly to determine the association between the type of FB and factors contributing to its occurrence (largest dimension, volume, witnessed); thirdly to determine the treatment required (inpatient, outpatient, surgical intervention, antibiotics and analgesia) and association between hand dominance with ENT FBs.

MATERIALS AND METHODS

Study Design

This was a prospective cross-sectional observational study on ENT FB among children and adults presenting as an inpatient and outpatient to the Department of otorhinolaryngology, head and neck surgery at Hospital Canselor Tuanku Muhriz (HCTM), Universiti Kebangsaan Malaysia (UKM); a tertiary centre in Kuala Lumpur, Malaysia. The study period from a selected population of patients with ENT FB was over 12 months from 1st of February 2017 to 31st January 2018. The study was approved by the research ethics committee of the faculty of medicine UKM (FF-2017-060). The STROBE recommendations for observational studies were adhered to.⁹

Bias

A proforma was prepared and details of patients (and guardians) were recorded during consultation to reduce potential bias after obtaining an informed consent. A standardised ruler on the proforma was used to measure FB dimensions. Three measurements were taken for every dimension. Missing data within the proforma was filled up via telephone call or on outpatient follow-up. The departmental census was checked to ensure FB cases were not missed.

Participants

Inclusion criteria involved all children below eighteen years (<18) which falls into the paediatric population of Malaysia.¹⁰ Adults are patients with ages eighteen and above (≥18). All cases are seen by an ENT doctor (specialist and/or medical officer) either via on-call referrals, in hospital referrals or outpatients. This included FB dislodged in the lower airways (trachea, bronchus and bronchiole) and upper gastrointestinal (GI) tract (oesophagus). Exclusion criteria

included FB dislodged in non-ENT orifices such as the stomach and beyond with no other ENT FBs.

Outcome Measures

Organic FBs are defined as objects derived from parts of organs of living (or previously lived) organisms such as animals, plants or fungi. Inorganic FBs are derived from non-living products such as metals or plastic. They were common in the ear and nose.

The incidence of ENT foreign body was calculated using the following formula

Incidence of FB:	(A + B + C)
Total number of new ENT cases during the period	

whereby A: number of ear FB; B: number of nose FB; C: number of throat FB

The Statistical Package for the Social Sciences (SPSS) version 19 (SPSS Inc., Chicago Illinois) was used for statistical analyses and calculations. Depending on their sample size distribution, the difference between two categorical groups were analyzed using Chi-square test for large sample size whereas Fisher Exact test for smaller sample size. For scale variables, all the variables were assumed on normality assumption or equality of continuous probability distribution. Noting with the normality assumption, the difference between two groups categorical with scale variable was analyzed using respective parametric statistical test, Independent Sample T test. The difference between more than two groups, categorical with scale variable was analysed using Analysis of Variance (ANOVA) test. All significance analysis was considered 95% confidence level or 5% level of statistical significance.

RESULTS

Incidence and epidemiology of FBs

The total outpatients and on-call referrals to ENT was 4374 patients. ENT FB seen during the same period was 153 patients. Therefore, the incidence of FB was 3.5%. A total of 82 (53.6%) patients had organic foreign body within the ENT region. They are more common within the throat. Majority of the organic FB were fish bones (47) followed by cotton (12) and tick (4). Mackerel (14) was the most popular fish bone organic foreign body among the adults, followed by red snapper (8) and tilapia (6). Seventy-one (46.4%) patients had in organic FB within the ENT region. Majority of non-organic FB were derived from manufactured plastic material (34) followed by metal (8) and graphite (3). Results were summarised in Table I. Incidence of organic FB was 1.9% and inorganic FB was 1.6%.

Incidence of ENT FB among children was 1.65% and adults was 1.85%. The mean age was 5.34 and 49.35 years for children and adults respectively. Children less than 5 years-old was one third at 48 (31.3%) (Table IIa). These age groups tend to have FBs in the nose (64.58%) followed by ear (27.08%) and throat (6.25%). Children between 5 and less than 18 have the most FB in the ear (72%). Both young and older adults have experienced throat FBs followed by ear (Table IIb). Among all children, 8 (11.6%) were disabled with

Table I: Types of Organic and Inorganic FB

	Organic (n, %) 82 (53.6%)	In-Organic (n, %) 71 (46.4%)
Type of FB		
Fish bone	47 (57.3%)	-
Cotton	12 (14.6%)	-
Tick	4 (4.9%)	-
Plastic	-	34 (47.9)
Metal	-	8 (11.3%)
Graphite	-	3 (42.3%)
Others	19 (23.1%)	26 (36.6%)
Fish Bones (Malay Name)		
Cod	1 (2.1%)	-
Catfish	1 (2.1%)	-
Mackerel	14 (29.8%)	-
Pegasi (Patin)	2 (4.3%)	-
Pomphret (Bawal)	2 (4.3%)	-
Red Snapper	8 (17.0%)	-
Sardines	2 (4.3%)	-
Scad (Selar)	4 (8.5%)	-
Seabass (Kurau)	1 (2.1%)	-
Snakehead (Haruan)	1 (2.1%)	-
Threadfin (Terisik)	1 (2.1%)	-
Tilapia	6 (12.8%)	-
Tolishad (Terubok)	1 (2.1%)	-
Torpedo Scad (Cencaru)	3 (6.4%)	-

Table II: Percentage of FB in accordance to gender and age and FB location in accordance to age

a. Percentage of FB in accordance to gender and age

	Female		Male		Total	
	N	%	N	%	N	%
≤ 5 years	23	35.94	25	28.09	48	31.37
6 - 18 years	9	14.06	16	17.98	25	16.34
19 - 55 years	25	39.06	24	26.97	49	32.03
> 55 years	7	10.94	24	26.97	31	20.26
Total	64	100.00	89	100.00	153	100.00

p-value is 0.058 which is insignificant (p <0.05)

b. Percentage of FB location in accordance to age

	<5 years		5- 18 years		19 - 55 years		> 55 years		Total	
	N	%	N	%	N	%	N	%	N	%
Bronchus	0	0.00%	0	0.00%	1	2.04%	0	0.00%	1	0.65%
Ear	13	27.08%	18	72.00%	10	20.41%	8	25.81%	49	32.03%
Oesophagus	1	2.08%	0	0.00%	2	4.08%	6	19.35%	9	5.88%
Nose	31	64.58%	4	16.00%	5	10.20%	0	0.00%	40	26.14%
Throat	3	6.25%	3	12.00%	31	32.28%	17	54.84%	54	35.30%

Table III: Mean volume of FB according the age and site

Age range (years)	FB Location				
	Trachea/ Bronchus (mm³)	Ear (mm³)	Oesophagus (mm³)	Nose (mm³)	Throat (mm³)
<5	49.68	570.2	261.77	171.53	
5 to <12	0	29.43	0	120.95	36.91
12 to <18	0	39.8	0	0	20.42
≥18	502.65	211.03	6644.59	56.78	242.45

Table IV: FB treated as outpatients

	Age Group		p-value
	child (<18 years) Count (%)	adult (≥18 years) Count (%)	
No of Patients	61 (86.9%)	69 (83.1%)	0.400
Antibiotics			
yes	12 (19.67%)	22 (31.88%)	
no	49 (80.33)	47 (68.11%)	0.585
Antibiotic Name (route)			
Co-amoxiclav (oral)	6 (50%)	15 (71.4%)	
Cefuroxime (oral)	0 (0%)	1 (4.76%)	
Maxitrol (ear drops)	1 (8.33%)	0 (0%)	
Ofloxacin (ear drops)	2 (16.67%)	3 (14.29%)	
Sofradex (ear drops)	3 (25%)	2 (9.52%)	*0.013
Analgesia			
yes	10 (16.39%)	24 (34.78%)	
no	51 (83.61%)	45 (65.22%)	0.623
Medical/ Sick Leave			
yes	1 (1.63%)	3 (4.34%)	
no	60 (98.37%)	66 (95.66%)	

*p-value <0.05 is considered significant

five had cognitive impairment such as autism, attention deficit hyperactivity disorder (ADHD) and speech disorder. Three were of a physical impairment with one adult having significant visual deficit and two children with significant hearing deficits. Among the children 18 (26.1%) had organic ENT FB while 51 (73.95) had inorganic ENT FB. 8 (11.6%) were hospitalised and 61 (88.4%) treated as outpatient.

In the adult group, only 3 (3.6%) were disabled. Among the adults, organic FB amounted to 64 (77.1%) and inorganic 19 (22.9%). 13 (15.7%) were hospitalised and 70 (84.3%) were treated as outpatients. Overall, the location with the most FB among children and adults are the throat (and base of tongue) at 35.3% followed by ear (32.03%) and nose (26.14%), see Figure 1a.

Factors in relation to ENT FB

The largest of the 3 measured dimensions and mean values were taken based on ages for ear, nose and throat respectively (Figure 1b). FB within the bronchus was only reported among adults with a mean of 12mm of the largest dimension. Ear FB were within 4 to 5.77mm among children and 7.97mm among adults. Oesophageal FB among children had the largest diameter of 22mm, almost half of that of adults at 38.94mm. Nasal FBs had a decreasing trend with age, contrary to throat FBs.

Nasal and throat FBs were comparable in volume with mean of 217.48mm³ and 220.18 mm³ respectively. Ear FB volumes were almost half with mean of 101.93mm³. However, throat FB volumes had a bigger standard deviation of 1341.59 indicating a larger spread. There was no significant difference between ear, nose and throat FB volumes. Ear and nose FB volumes for children became smaller with increasing age (Table III).

A third, 23 (33.3%) of FB incidents among children were witnessed. Parents were the highest witness at 13 (56.52%) followed by siblings 5 (7.2%) and caretakers 3 (4.3%). Sixteen (69.5%) among witnessed events were adults. Home (either

parents or caretakers' property) had the highest occurrence of FB insertion at 91.3% followed by school at 4.3%. One child (1.4%) accidentally ingested a FB while she was in a moving vehicle. More than half had FB incidents during their play time with 2 (2.9%) occurring when the child was asleep. Eleven (15.9%) of parents or carer were unsure of the child's activity during the FB incident.

The majority of adult associated FB occurred during or as a cause of eating with 63.9%. Eight (9.6%) occurred during ear cleaning with cotton buds and one gentleman (1.2%) had a stone into his ear while washing his car.

Treatment

Eight children (13.1%) and 14 adults (16.9%) from a total of 153 patients were hospitalized respectively as a direct cause of the FB incident. Seven (87.5%) children and all adults had FB in the aerodigestive tract. Among the hospitalised, 2(25%) children and 4 (28.6%) adults required either Intensive Care Unit (ICU) or High Dependency Unit (HDU) care. A total of 2 (25%) children and 3 (21.4%) adults required referral to other specialties (respiratory and cardiothoracic and upper gastrointestinal) surgery for multidisciplinary input. One child had a complication of hypoxic brain injury as a result of choking on soft food while being fed by his caretaker at a supine position. First aid had failed resulting in cerebral palsy and was discharged home in a dependent state. A total of 5 adults suffered from various complications ranging from lung collapse, laryngeal oedema, pneumonia, oesophageal perforation and oral ulcers/ laceration. No deaths were reported secondary to FB.

The remaining patients 61 (86.9%) and 69 (83.1%) of children and adults respectively were treated and managed as an outpatient (Table IV). Twelve (19.67%) children and 22 (31.88%) of adults were prescribed oral antibiotics to be completed at home. Co-amoxiclav was the highest prescribed oral antibiotics among 6 (50%) children and 15 (71.4%) adults. Ofloxacin (Tarivid) and Dexamethasone/ Framycethin/ Gramicidin (Sofradex) topical ear drops were

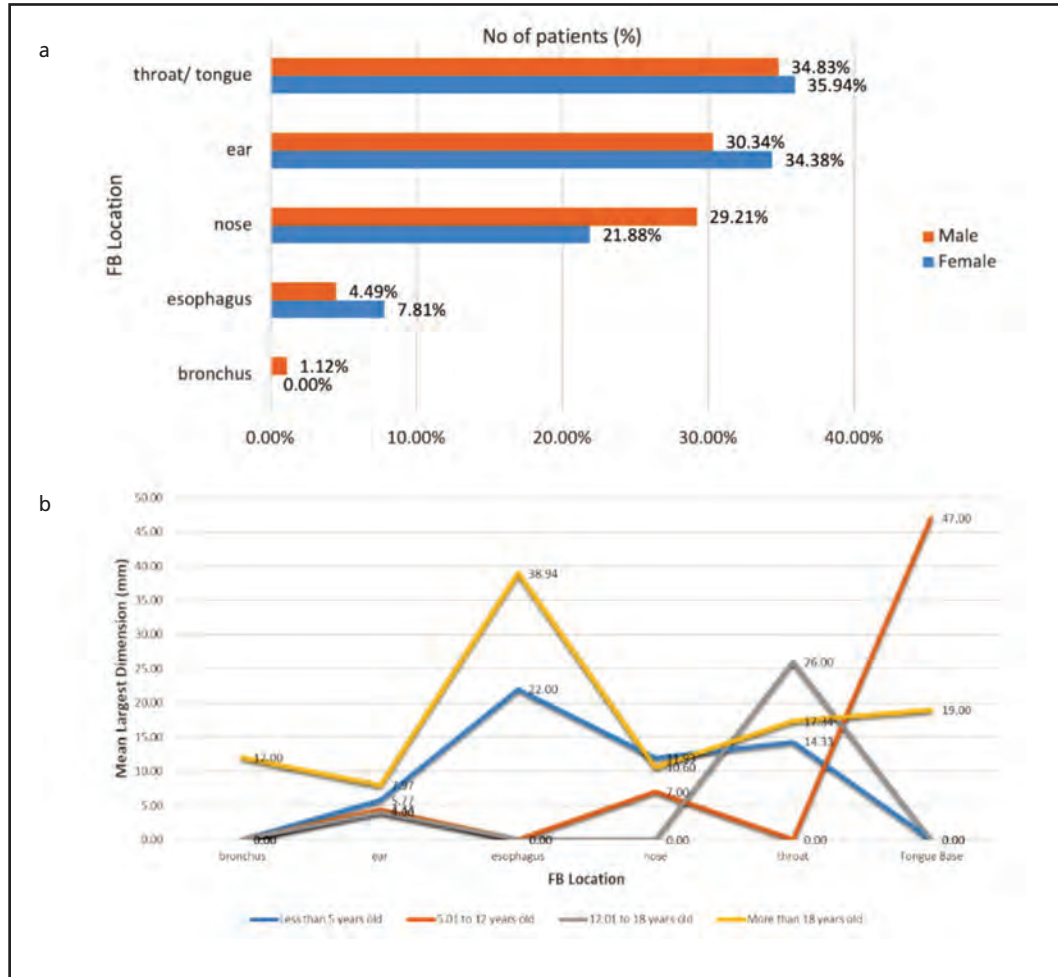


Fig. 1: a. FB location in association with gender; b. Mean largest dimension of FB in relation to age in the ear, nose, throat, oesophagus, bronchus and tongue.

prescribed among five children and adults respectively. Significantly more adults (34.78%) required analgesia compared to children (16.39%). Only one child and 3 (4.34%) adults required sick leave for the day due to their outpatient visit.

A total of 57 (37.25%) patients required endoscopic treatment either as an office-based procedure or in the operation theatre. For the endoscopic procedure, only three had a flexible endoscopy in the form of Flexible-Naso-Pharyngo-Laryngo-Scopy (FNPLS) without a working channel strictly used to visualise a FB. Two were for a fish bone removal and one was to visualise an ingested tobacco ball which subsequently required an upper gastroscopy. Majority of children, 55 (76.4%) did not have endoscopic treatment. This is in reversal to adults with 54 (66.7%) requiring endoscopic treatment which was significant.

Thirty-two (20.9%) patients had complications as a direct result of their FB. Ten were hospitalised and 22 managed as an out-patient. Common complications were bleeding (including epistaxis), inflammation, mucosal ulceration/laceration, aspiration and tissue necrosis. One in-patient required a tracheostomy for his laryngeal oedema and failure of extubation.

Hand Dominance and the presence of ENT FB

Majority of FB within the right ear or nose (94.34%) were from the right-hand dominant patients with only 5.66% being left hand dominant. On the other hand, FB within the left ear or nose were common also among right hand dominant patients at 78.26% compared to 21.7% from those with left hand dominance. The difference is statistically significant but does not correspond to site.

DISCUSSION

This study provides the first comprehensive annual incidence rate for ENT FBs in a tertiary center in Peninsular Malaysia. ENT FBs are common in HCTM with an annual incidence of 3.5% (3 to 4 cases of FBs in every 100 ENT consultations). The incidences among children and adults are similar at 1.65% and 1.85%; comparable to the European incidence of 2%.⁷ Organic and inorganic FBs for this study had no significant difference. Organic FBs often occur in the throat, esophagus, trachea and bronchus as it is often food placed into the mouth. The biggest contributors to inorganic FBs were the nose and ear. Children accounted for the highest rate of inorganic FBs into their aerodigestive tract. It is their innate and curious nature that provokes non-edible objects insertion into their ENT; having FBs in their mouth while playing and crying; and lacking adequate molars for chewing food.¹¹

Adults had a higher incidence of organic FBs due to fish bones. Each Malaysian consumes on average 45-55kgs of fish annually, above the 20kg per capita of world average; with 33% consuming fish daily and 78% twice weekly.¹¹⁻¹² Malaysian consumption is on par with her eastern neighbour, Japan (64.7kg/person/year).¹¹ Popular fishes were mackerel followed by seabass and grouper which is similar to our data.¹¹⁻¹² However, there was little data and literature on the method of preparation (fried or steamed) as fried fish may have a lower incidence due to its crispier nature-allowing bones to be chewed easily compared to steamed preparation. Future work should compare the risks of fish bone FBs from stewed versus fried as it's a norm here for fish to be cooked as a whole with its bones intact rather than boneless fillets.¹³

Chevalier Jackson from US pioneered the modern-day FB study with 3200 objects between 1920 and 1932. The data derived from the Small Parts Test Fixture (SPTF) in the US in the 1970s to guide the industry. It is a cylinder with a superior diameter of 1.75 inches (44.45mm) representing the mouth opening and lower depth of 1.50—2.25 inches (38.1mm to 57.15mm) emulating the pharynx.¹⁴⁻¹⁵ Similarly, across in Europe the Safety of Toys Specifications for Mechanical and Physical Properties has advised on a similar cylinder test to reduce the risk of choking in children less than 3 years old. Its dimensions were 31.7 mm on the superior diameter (largest opening of the anterior jaw in a child less than 3 years old) with a lower depth of 51.7mm and 25.4mm. Objects larger than the cylinder were deemed safe for children of ages 3 and above.¹⁶ However, it is without its controversies. Milkovich et al (17) suggested for an open-bottom gauge with a 38.1mm diameter for non-spherical objects and 44.5mm for spherical objects as 23% of 93 incidents of aerodigestive FB failed to be detected by the existing cylinder test.¹⁷ Asia or South East Asia have yet to have a similar guide for the industry to date. This UKM data showed that the mean largest dimension of throat and esophagus FB for children below 5 were 14.33 and 22mm, which were smaller than Chevalier's, the European data and Malkovich's data.

Aerodigestive FB have been shown to be common in children ages less than 4 years old. The Susy Safe registry looked into 16 878 FBs among children with a hallmark finding of ENT FB of the aerodigestive system are more common in ages less than 3 years old with oesophageal FB being more common in less than 1 years old.⁵ In order to determine what length of object is suitable for children, we first must revisit the aerodigestive anatomy. A new-born vocal cord has a length of 2.5 – 3mm, increases in size until the age of 20 whereby the vocal cord length of an adult male is 17-21mm and female 11-15mm.¹⁸⁻¹⁹ Therefore, the largest mean dimension of throat FB among children less than 5 years old was 14.3mm and adults was 17.34mm, too large to pass through the laryngeal inlet. The paediatric larynx is conical shape, matures with age with formation of ligaments from the age of 4 to take up a more cylindrical shape in adulthood. The paediatric epiglottis is softer and pliable, comes into contact with the tongue base as it sits higher within the neck.²⁰ This allows an easier excess of FB into the larynx and trachea.

On the other hand, the subglottis at approximately 4mm is the narrowest in the paediatric population compared to adults.¹⁹ Therefore, to quantify the safe dimensions of aerodigestive FB based on the vocal cord length alone is inadequate as it continues to grow. Ideally, an object ought to be large enough to not bypass the oropharynx itself. Gag reflex will allow the child to cough and expel the object, preventing choking. Therefore, the cylindrical method of measuring a safe object is ideal for the industry for now. FB accidents among children occur when left alone without supervision. However, among the third with supervision, to our surprise, almost 70% were under direct adult supervision. There were two probabilities-either the adults were distracted with chores, or were not aware of the risk associated with FBs. Beads were one of the highest inorganic FB among children, probably due to its decorative presence on textiles and Malaysian traditional clothing.

Given that the majority of adult FB were organic in nature, it is of no surprise that adult FB were non-occupational hazards and occurred in the domestic setting. One patient swallowed a bottle cap and another an aluminium foil housing paracetamol tablets. Since homemakers, retirees and unemployed adults make up the largest numbers, like children, adult FB does have a susceptibility to occur at home. There was no significant change in incidence of ENT FBs during the COVID-19 pandemic lock-downs compared to pre-pandemic times indicating that home poses a significant risk.²¹ Oesophageal FB among Malaysian and Asian adults were due to fish bones unlike the western world which was primarily due to meat products.²²⁻²³ Oropharyngeal FB among adults were commoner among the younger age group as compared to oesophageal FB which was predominant in the older age group.²³ It is postulated that ageing related decadence of swallowing physiology is a contributing factor to the higher incidence of oesophageal FB among the older population.²³

More adults required analgesia due to odynophagia caused by fish bone ingestion. Ear FB may be associated with otitis externa from external canal trauma or localised infection with *Pseudomonas aeruginosa*, *Staphylococcus aureus*, *Hemophilus influenza* that were sensitive to ofloxacin and Framycethin/ Gramicidin (Sofradex) topical antibiotics.²⁴⁻²⁶ Systemic co-amoxiclav is a Beta (β) Lactamase inhibitor consisting of amoxicillin, a β -lactam antibiotic, and potassium clavulanate is a broad-spectrum antibiotic for upper respiratory tract and infections from oral bacterial flora.²⁷ Metronidazole is occasionally added for aerodigestive FB for anaerobes cover. Esophageal mucosal penetration and perforation can occur in more than 50% of cases, therefore prophylactic antibiotics in such cases should be considered even in the absence of mediastinitis.^{22,28}

Although less than half of overall patients required an endoscopic treatment (otoendoscopy, nasoendoscopy, laryngoscopy, tracheoscopy, bronchoscopy, oesophagoscopy), majority of adults required an endoscopic procedure. Adults presented with fish bone, if involving the lower segment of the oropharynx (inferior poles of tonsils and base of tongue), laryngopharynx or oesophagus, often benefitted from laryngoscopy (diagnostic and therapeutic).

Right handedness has been said to be primitive to feeding to the human race as it has been shown that apes would always prefer to reach out for food with their right hands.²⁹⁻³⁰ Hand dominance may be handy in predicting which nostril or ear to look into if a FB incident was not witnessed and when the child is unreliable for a history or decide on which hand to apply mittens on for recurrent offenders. However, this remains a postulation as the evidence behind this is scarce. This study and others have shown that motor laterality or hand dominance is not a predictor of the laterality of ENT FB insertion.³¹

Better education on the awareness and prevention of ENT FB among children is required. A multidisciplinary and multicenter audit on ENT FB should be conducted nationwide for a larger population based on data on the volume of aerodigestive FB and risk of choking among children. This is to guide the local industry on responsible determination of safe ages for toys and food.³² FBs removed by the paediatric and emergency specialties were not included as it was not a multidisciplinary study potentially underscoring the overall incidence. Volume calculations for FB may be inaccurate especially for fish bones which were assumed to be cylindrical for ease of measurements. Fish bones may take a conical or tapered cylinder shape which may overestimate its volume if assumed to be a cylinder.³³ A larger sample is required to explore hand dominance and laterality of ENT FBs.

CONCLUSION

ENT FBs have a high overall incidence of 3.5% with children being 1.65% and adults 1.85%; commonly inorganic in children and organic (fish bone) among adults. FBs among children were not witnessed, located in the oropharynx and occurred at home and during playtime. FBs in adults were predominantly fish bones within the aerodigestive tract, non-occupational and associated with more pain requiring analgesia. Aerodigestive FBs were associated with hospitalization, complications, requiring antibiotics and endoscopic intervention. Hand dominance is not a reliable predictor for laterality of ear and nose FBs. This calls for a local regional policy for choking hazards for toys and food among children based on local data on FB dimensions and better public education as FB injuries are preventable.

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CONFLICT OF INTEREST

The authors declared that there are no direct or indirect financial interests or conflict of interest for disclosure.

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