

Foreign bodies in otorhinolaryngology among teenagers and adults observed in reference hospital in Mozambique

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Abstract: Foreign bodies can affect physically and emotionally the patients and leads to significant financial expenses to people affected and to health services. This study aimed to characterize the epidemiological profile of patients with 14 or more years of age observed with foreign bodies at Oto-rhinolaryngology Service at quaternary reference hospital in Mozambique. An observational, descriptive study was carried out, using retrospective data from 1983-2009, from patients with 14 or more years old diagnosed with foreign bodies in otorhinolaryngology at quaternary reference hospital in Mozambique. Multiple sources of data were used to obtain information which was subsequently introduced in specifically created database and data analysis was mainly descriptive. A total of 1696 patient's data were collected and analyzed. No gender differences were observed, and most cases were analyzed in age-group 30-39 years (23.93%). Cotton was the main foreign body (21.40%) among males and fish bones for females (52.53%). Ear was most common site among 15-39 years, while esophagus and pharynx was for 30-39 years group. The study includes 26 years of data representing important source of evidence. This evidence can contribute for the development and implementation of preventive and control strategies at population level and subject of health professionals training programs.

Keywords: Foreign bodies; Otorhinolaryngology; Adults; Adolescents.

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1. Introduction

Foreign bodies (FB) in natural orifices of the head and neck affect children and adults. The available literature largely focuses on the issue of foreign bodies from a clinical point of view and there are few studies about the impact on the public health [1]. Foreign bodies cause physical and emotional damage in patients, but also carry significant financial burdens to both, injured people as to the Health Services. For example, the foreign bodies have a weight in the Emergency room of Otorhinolaryngology (ENT) ranging from 4% [2] to 41,3% [3] depending on the type of health facility and the study population.

In adults, the causes of foreign bodies have different causality and typology relatively from younger children. The incidents on this population occur accidentally or unintentionally as consequence of work accidents or voluntary intake of spine, or bones as happen with recluses in suicide attempts and with mental disorders patients [4]. The type

of foreign bodies observed in patients differs in the literature and depends on the cultural and dietary habits of the population in question [5].

The biomedical literature for occurrence of foreign bodies in the natural orifices of the head and neck in adolescents and adults is rare. The few existing publications on the subject are reports of clinical cases and/or case by case in the general population [6]. There are specific forms of presentation in adults especially in types of foreign bodies involved. Thus, this study aims to characterize the epidemiological profile of patients older than 14 years affected by the foreign bodies observed in the Service of ENT.

2. Methodology

2.1 Location and Population study

This is an observational, descriptive study that used retrospective data of all patients older than 14 years old diagnosed with foreign bodies in a Maputo Central Hospital, the main and Quaternary Hospital of Mozambique over a period of 26 years. There were included all patients consecutively observed from 1 January 1983 to 31 December 2009. There were excluded all patients whose clinical information was incomplete, that is, they had no information of the type of foreign bodies and its anatomical location. It is about a Quaternary unit and with reference in the country, with about 1500 beds and with specialized services available and is also teaching hospital for doctors and other healthcare workers.

2.2 Collection and data analysis

The data collection was done through an elaborated form for this purpose, trying to capture the following data: sex, age, date, type of foreign body, anatomical location, treatment, and complications. To identify the cases were reviewed the record books of external consultation, Emergency Service book, Book of service treatment room, small surgery book and Book of operative protocol of the Central operating room, ENT operating room and Emergency Service operating room (SUR). Were also consulted the medical records of the patients, especially when the information from the record book showed up incomplete.

The data were inserted into a database specially created for this purpose. The analysis of these documents was essentially descriptive which included: the presentation of the distribution by gender and age group, description of the foreign bodies most involved, among others. The results were presented in tables and frequency graphs.

2.3 Ethical considerations

This study received approval from the Hospital Direction (900/002/GMS/2010) and Bioethics National Committee of Health (128/CNBS/2010). To accomplish the good ethical practices essential in research, we tried in all moments to ensure the confidentiality of data to protect them through the anonymization of data, the use of passwords and by restricting the access only to researchers of this research.

3. Results and discussion

During the study period (1983-2009) there were analyzed data of 1696 patients over the age of 14 years old with foreign bodies in the natural orifices of the head and neck. The annual average of the observed patients was 65,23 patients. There weren't observed important differences in the distribution of cases over the months of the year. The occurrence of cases over the week showed up more or less identical, except on weekends where fewer cases were noted.

Most patients with foreign bodies observed in the HCM during the period from 1983 to 2009 were from Maputo City and Province (78.6%, 1332/1696), followed by Gaza (8%, 135/1696) and Inhambane (6.4%, 108/1696). Most of the patients observed were students

(26.29%; 446/1696), followed by unemployed (17.80%; 302/1696). However, to emphasize we noted a considerable lack of data about the profession or occupation of the patients (30.54%; 518/1696). There is no difference in the occurrence between the males and females (coincidentally both with 50% or 848/1696).

The Figure 1 shows the distribution of cases by age group and sex. The distribution of different age groups is variable and showed predominance of cases in patients with age between 30 to 39 years (23.93%; 406/ 1696). Foreign bodies can be classified as organic and inorganic [7]. Organic bodies may be spines of fish /animal bones, seeds/grains and living things (still in living state or dead), while inorganic can be foreign bodies composed of metals, plastics, wood, glass, sponge, paper, rubber. In this study the majority of the foreign bodies were organic type (64.40%; 1093/1696). If taking in consideration both sexes together, fishbones, bones and meat were the most frequent foreign body, accounting for 52.50% (891/1696) of all foreign bodies diagnosed, followed by cotton (21.40%, 363/1696).

Figure 1. The distribution of cases of patients observed during the study period with foreign bodies, by age group and sex during the period from 1983 to 2009.

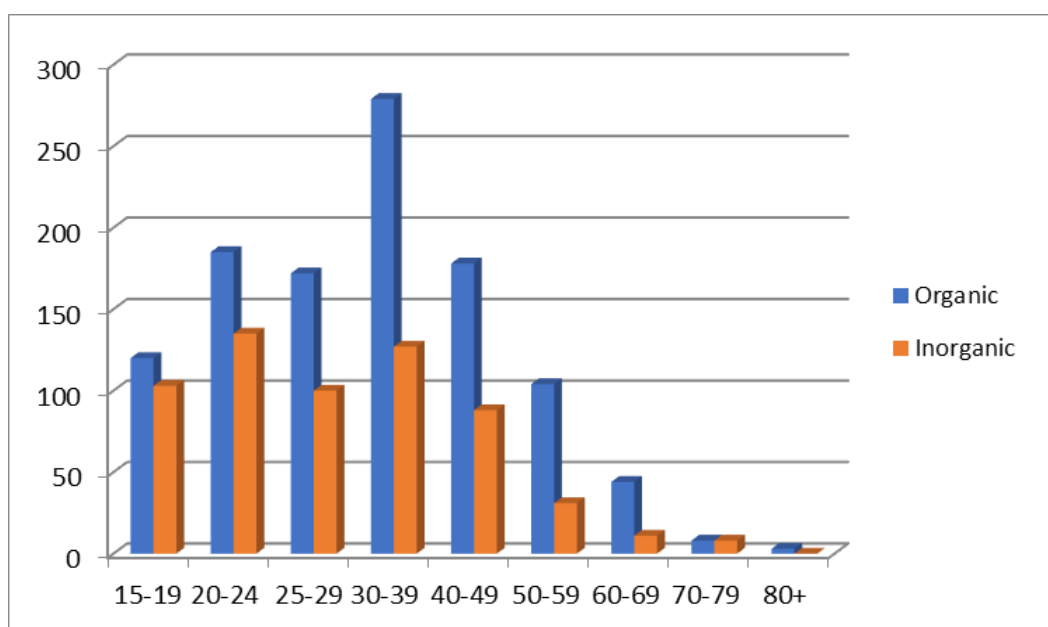


Figure 2 shows the distribution of the nature of the foreign bodies by age group. Organic foreign bodies were more frequent than inorganic in all age groups in this study, especially in the range of 30 to 39 years old. However, if we observe separately the frequency of presence of different types of foreign bodies by gender, as shown in Figure 3, we found that cotton appears more in males (53.16%; 193/363), while fishbone is more common in females (51.40%; 458/891).

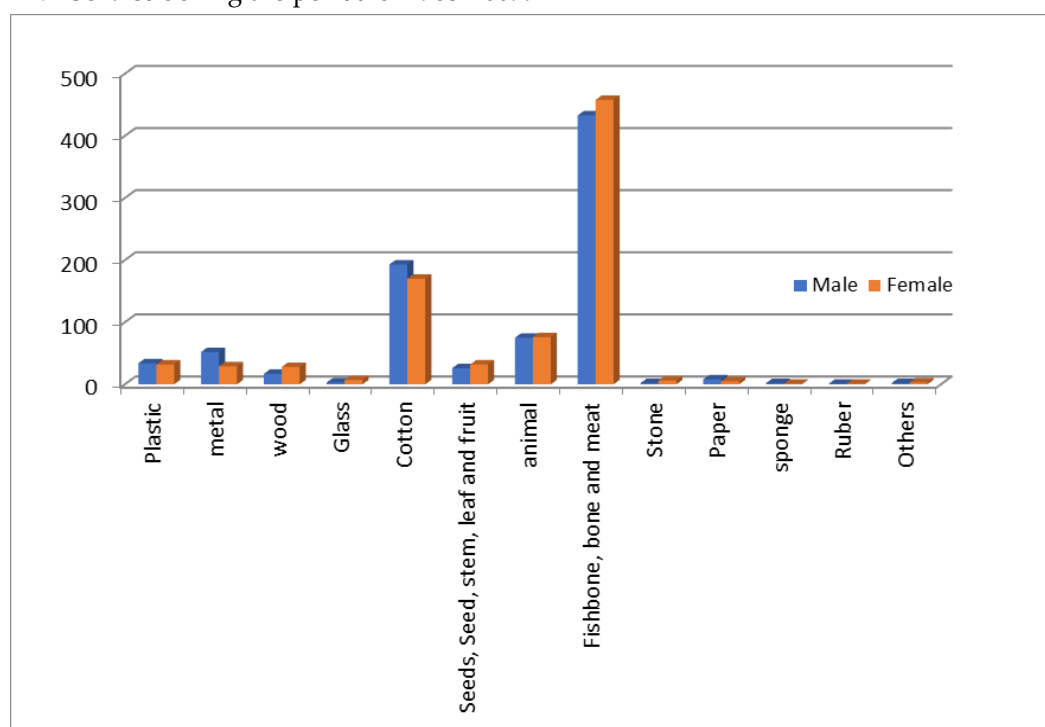
As we can see in Table 1, cotton appears more between the ages of 20-24 years, while organic foreign bodies of animal origin appear more between ages of 30-39 years.

Table 1. Distribution of foreign bodies found in the observed patients in ENT Service during the period from 1983 to 2009 by age group.

Type of FB	15-19 years	20-24 years	25-29 years	30-39 years	40-49 years	50-59 years	60-69 years	70-79 years	80+ years	Total
Plastic	14	8	13	15	10	5	1	0	0	66
metal	31	19	9	10	12	0	0	0	0	81

Wood	3	11	5	18	6	1	0	1	0	45
Glass	0	6	1	1	1	1	0	0	0	10
Cotton	47	79	68	71	58	22	10	8	0	363
Seeds, Seed, stem, leaf and fruit	20	13	4	13	2	4	0	2	0	58
animal	27	30	21	34	23	11	5	0	0	151
Fishbone, bone and meat	74	145	149	233	153	90	39	5	3	891
Stone	4	2	1	1	0	0	0	0	0	8
Paper	0	4	1	7	0	1	0	0	0	13
Sponge	2	0	0	1	0	0	0	0	0	3

Figure 2. The distribution of the nature of the foreign bodies by age group observed in ENT Service during the period of 1983-2009.



As can be seen by the Table 2, most of the foreign bodies were in the external auditory canal (40,03%, 679/1696), esophagus (30,30%, 514/1696) and pharynx (27,40%, 464/1696). Correlating the age with the location of the foreign body in Table 2, shows that in the age group of 30 to 39 years there is predominance of ear foreign bodies (36,20%, 147/406), followed by esophageal (31,28%, 127/406) and pharyngeal foreign bodies (29,55%, 120/406). Foreign bodies from the ear are more common between the age of 15 to 39 years, while esophageal and pharyngeal occurs more in the range of 30 to 39 years. Foreign bodies of the airways were rare in this study.

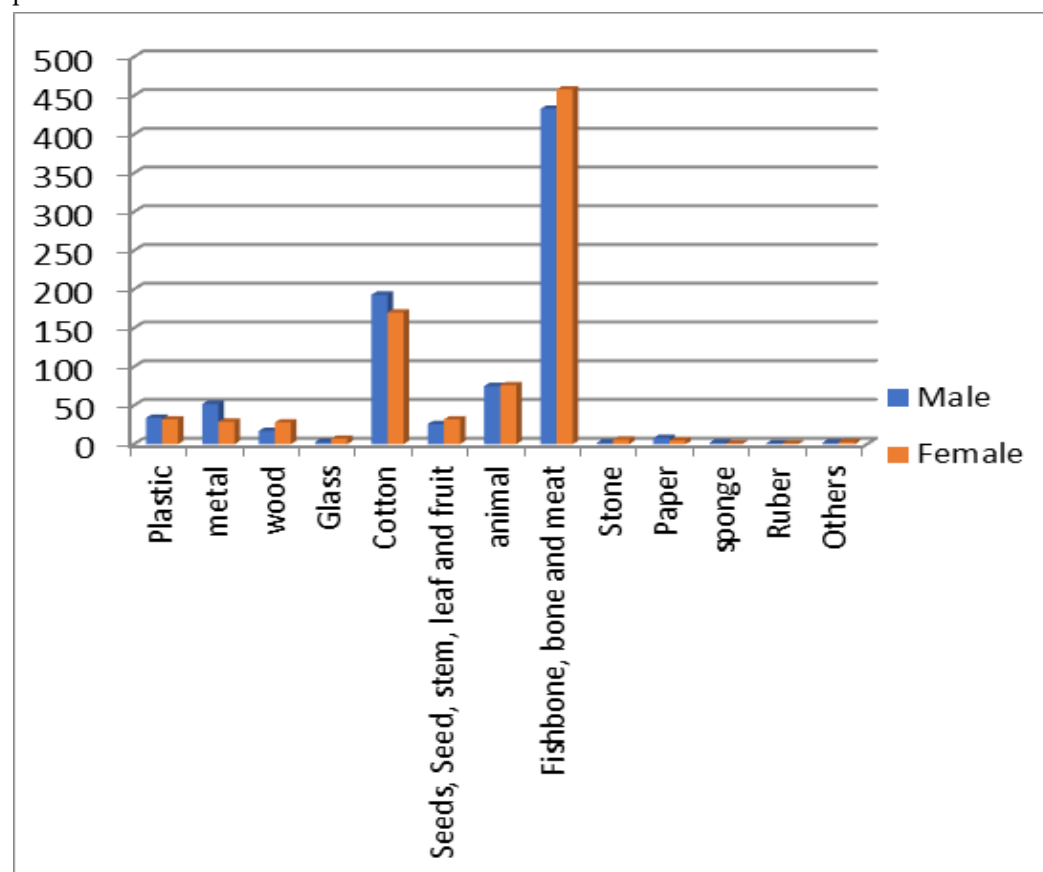
In Table 3 it is observed that the otoscopic with instrumental extraction or washing was the most common for the extraction of the foreign body (39,50%), followed by esophagoscopy (29,50%) and pharyngoscopy (15,60%). There is to note that in 16 patients the foreign body came out spontaneously (0,90%). However, it is important to refer that 63% (1069/1696) of the patients with foreign bodies observed during the period of this

study were treated without general anesthesia and 36,6% (621/1696) undergoing general anesthesia.

Table 2. Location of foreign bodies in observed patients in the HCM during the period from 1983 to 2009 by age group.

Location of FB	Age group									Total
	15-19 years	20-24 years	25-29 years	30-39 years	40-49 years	50-59 years	60-69 years	70-79 years	80+ years	
Mouth	1	1	3	0	1	1	0	0	0	7
Larynx	1	0	3	10	1	0	1	0	0	16
Pharynx	52	90	77	120	70	43	10	2	0	464
Esophagus	46	80	77	127	99	49	28	5	3	514
Trachea	1	0	1	0	1	0	0	0	0	3
Bronchus	0	0	1	0	0	0	0	0	0	1
Nose	4	2	3	2	0	1	0	0	0	12
Ear	118	147	107	147	94	41	16	9	0	679
Total	223	320	272	406	266	135	55	16	3	1696

Figure 3. Distribution of different types of foreign bodies by sex in the HCM during the period of 1983-2009.



Most esophageal foreign bodies were removed using rigid esophagoscope (96.88%; 498/514). The spontaneous expulsion of esophageal foreign bodies was observed in 2.72% (14/514) of the cases. In one of the cases, it was necessary to do esophagostomy as result of the massive foreign body that was stuck in the esophagus. Foreign bodies of the pharynx are in the tonsils, in the posterior Wall of the pharynx, in the hypopharynx and rarely recorded in the nasopharynx. Over the half (55.38%; 257/464) of the pharyngeal foreign bodies was extracted using a lower-tongue and Magil pinch or Kelly (pharyngoscopy), followed by extraction with laryngoscope of McTosh (41.81%, 194/464). Most of the ear foreign bodies were extracted by washing it or with instrumental extraction, using a conventional otoscope and 2.20% (15/679) was necessary usage of microscope.

Table 3. Location of foreign bodies in observed patients in the HCM during the period from 1983 to 2009 by age group.

Nome of interventions	Frequency	Percentage
Esophagoscopy	29.5	29.5
Direct Laryngoscopy	0.7	30.2
Laryngoscopy with blades	11.9	42.1
Rhinscopy	0.7	42.8
Otoscopy	39.0	81.8
Pharyngoscopy	15.6	97.4
Bronchoscopy	0.2	97.6
Indirect Laryngoscopy	0.4	98.1
Esophagotomy	0.1	98.1
Left spontaneously	0.9	99.1
Endoaural incision	0.1	99.1
Otomicroscopy	0.9	100.0

It was found that in the ear, the most common foreign body was cotton (53,31%, 362/679), while the fishbones/bones were more frequent in the pharynx (97,84%, 454/464) and in the esophagus (79,76%, 410/514). It has been found that cotton from cotton swabs was more common in the external ear canal (99,72%, 362/363). The metals appear mostly in the esophagus (76,54%, 62/81). The most common metals objects were coins (37,03%, 30/81). The wood-based objects such as sticks are more frequent in the external auditory canal (95,55%, 43/45). Glass fragments were found in most of the cases in the esophagus (70%, 7/10). The foreign bodies of botanical forum, such as seeds, grains, leaves and stems are found more at the level of external auditory canal (84,48%, 49/58).

The food parts such as fishbones, bones and meat pieces appeared more in the pharynx (50.95%; 454/891) and in the esophagus (46.01%, 410/891). In the digestive tract, the fishbones were the most frequent (78.27%, 771/985). Various foreign bodies such as insects, cockroach, larva, etc., were found in the external ear canal. The stones appear more in the external ear canal (87.50%, 7/8). Paper, sponge, and rubber have also been found in the external ear canal.

Complications by foreign bodies are not uncommon. However, the registration of the complications is not always carried out in a systematic and complete form which constitutes an important limitation particularly for this study as it was based on retrospective data. Nonetheless, it was found 55 patients with complications, during the study period. Most cases of complications were found in the esophagus (50.90%, 28/55) and in

the ear (36.36%, 20/55). Perforation of the tympanic membrane was the largest complication of the foreign body in the ear (1.03; 7/679). Most foreign body complication in the esophagus was the esophagus perforation (1.75%, 9/514). There was one death related to foreign body, in a 22-year-old patient with psychosis who voluntarily ingested a wire fragment which produced a perforation on the esophagus and cause a mediastinitis.

4. Discussion

This study is part of a large study carried out as part of the author's thesis. The data, despite being relatively old, are very useful considering another study has never been carried out again in Mozambique. This work corresponds to the data analysis of patients with foreign bodies diagnosed in Maputo Central Hospital for the period of 1983 to 2009 with important results, particularly if we consider the lack of evidence on the topic in the country. To be a hospital registry study, the data cannot be extrapolated to the general population.

In this study, there was not a pattern in the distribution of the foreign bodies by annual seasons, as it occurs relatively regularly in every month of the year. However, a study in Spain [8], observed variations with higher incidence of foreign bodies in the summer. In this study, the occurrence of the cases was less on the weekends compared with weekdays. However, we found no literature reporting data about temporal occurrence with respect to the weekdays of foreign bodies, therefore, cannot be take any conclusion on this subject.

In this study, the occurrence of the cases taking into consideration of the gender was identical. In South Africa, the study showed no differences in gender [2]. In the literature and in our own experience, the distribution of FB by sex shows a male predominance, if we consider all age groups, but in the present study, and because it is a study with an adult and adolescent population, there difference in the sexes, because this condition is more common in the pediatric population, not showing sexual preference in adults. However, the literature reports some ambiguous results, with a predominance in some of the cases occurring in men [9], but in other cases there was predominance in females [8, 10].

This study showed that most of the foreign bodies were organic type (64.40%). These results do not resemble with the Dominican Republic study [11]. Contrary to studies with the presence of a group of children, here we did not find FB like coin, pieces of toys, plastic pieces, small seeds, etc. In this group, the most common is organic, especially fishbones in the digestive tract and cotton swabs used to self-clean the ears. This study showed that the fishbone was the foreign body more found (45,45%). This finding reflects somehow the dietary habits of our population since fish consumption is common especially in coastal areas of Mozambique. The researchers [5] say that the type of foreign body depends on the dietary habits of the population, which determines that the fishbones are more frequent in the oropharynx and poultry bones are more common in the esophagus.

Some results of this study were opposite to the expected. For example, the higher incidence of cotton in the ear in men (53,16%) and higher rates of fishbones and bones in women (51,40%). Taking in consideration the local customs and cultural practices, we expected to find more cases of cotton in the ear in women because they are the ones that most appeal to swabs and care relatively more than men with the cleanliness and hygiene of the body. Similarly, men are given primacy to meat and fish in local habits and cultural practices, therefore, it was expected more cases of fishbones and bones in men compared with women. However, we found no literature that allow us to elucidate on these disparities found. It was noted in a Hong Kong study [12] that there were more cases of fishbones in females.

Foreign bodies from the ear were more frequent in the age group of 15 to 39 years old, probably because this age has greater care with cleansing the body. It was no found any literature with reference about this subject. The esophageal and pharyngeal foreign

bodies occurred more between the ages of 30 to 39 years, like the study of Chung carried out in Hong Kong [12], by adopting a lifestyle, at this age there is greater consumption of animal protein on weekends, accompanied by alcohol, which reduces pharyngeal reflexes and makes people more susceptible to accidents with fishbone and chicken bones. As expected, foreign bodies from airways were rare in this study.

In this study, generally, the foreign body from the external auditory canal was the most frequent anatomical location. These results are like those found in other studies [13-20] but differs from the study of Singapore where there was an almost identical distribution of foreign bodies from the ear, nasal passages, and pharynx [21]. In contrast, studies in India and South Africa have shown a nasal foreign body predominance [2, 22]. The itching, fullness, hearing loss and ear pain incite people to use swabs or other objects such as tweezers or hairpins to relieve the symptoms.

Our results are supported by most studies [13, 18, 23, 24], where the foreign body most found in the ear of adult patients and adolescent was cotton. However, a different situation may occur as in the Brazil study [25] where there was a predominance of insects. In the same way, our results confirm the findings found by Sarafoleanu [26], where most foreign bodies found in digestive tract were the fishbone. However, studies in Spain [27] and Ethiopia [28] show higher incidence of bone fragments. The fish represent an important source of protein for coastal population of Mozambique, and we found that the results can in somehow be related to this.

In this study, the foreign bodies of the esophagus represented the second most common anatomical location (30,30%), like studies carried out in Spain [8][10]. In Ghana, the esophageal foreign bodies were reported as the most common cause of emergency in ENT [3]. The pharyngeal foreign bodies represented the third most frequent anatomical location in our study, unlike the Spanish studies [8, 29], where were the most prevalent. In the general population, the pharyngeal foreign bodies are reported to be more common in adults compared to children [30]. Our study shows similarities with other studies [14], where the fishbones is the foreign body, most found in the pharynx, especially with consumption of small fish that is cheaper and therefore more accessible to poor population but have relatively small bones increasing the risk of jamming [30]. The same applies to the foreign bodies in the esophagus where we find a predominance of fishbone. The literature [14] points to higher incidence of pharyngeal foreign bodies in the tonsil's regions and base of the tongue (lingual tonsil), probably due to the presence of tonsils crypts that favor the food retention.

The literature [26, 31] says that in adults, the most common causes for presence of foreign bodies are, among others: the imperfect chewing of the food; carelessness during chewing; imperfect preparation of the food; imperfections in the teeth or no teeth and/or the presence of prostheses that reduce the sensitivity of the mouth; escape of the teeth into the airway during extraction under general anesthesia; the suction of objects during periods of sleep or unconsciousness; excessive use of alcohol; and accidents at work, especially when the people put small objects in the mouth like needles.

It is reported in the literature [32] that about 80 to 90% of the foreign bodies in the esophagus spontaneously migrate to the stomach that's why only 10 to 20% need endoscopic extraction and 1% surgical extraction. But in our study, we noted spontaneous expulsion of the esophagus in only 2.72% (14/514) of the cases. However, we may be facing an underreporting or registration. On the other hand, the spontaneous migration of the foreign body into the stomach, can make the patient feel relieved and neglect the demand for medical care.

Most cases of complications observed in this study was in the esophagus, (50.90%). The second most frequent location of the complications, in this study, was the external auditory canal. In this study, there were 1.75%, cases of esophageal perforation. This finding is, in some way, like another study [32]) where the esophageal perforation was 0.75% of the cases.

Many authors [13, 14] reported that external otitis is the most common otic complication. However, in our study, like other studies [19, 33, 34], perforation of the tympanic membrane was the major complication (1,03%), probably because the cases of external otitis have been underreported and/or received treatment post observation by practitioner at the level of primary health care. On the other hand, the cases of perforation are more commonly referred to specialist of ENT for observation. While in other studies [23, 35, 36], recorded as the most common complications the laceration and abrasion of the skin of the external auditory canal; in our case it may have been not appreciated by the patient and/or practitioner and consequently be underreported.

Esophageal FBs can only be extracted with endoscopic methods under general anesthesia given the deep location of the esophagus. The FBs of the ear benefit from extraction mainly through washing, followed by instrumental extraction.

Esophageal FBs can only be extracted with endoscopic methods under general anesthesia given the deep location of the esophagus. The FBs of the ear benefit from extraction mainly through washing, followed by instrumental extraction. During the period analyzed, the Hospital did not have computerized records and the operating room books, the safest source of information, did not have an item to record complications. Complications, history, and treatment, then medication is recorded in the patient's individual records. These bulletins were not always possible to find or were not entirely completed. The major limitation of this study is the underreporting of data.

With the acquisition of better imaging equipment, such as digitalized x-rays and CT scans, an increase in specialized human resources in otorhinolaryngology, new otorhinolaryngology equipment, such as a microscope and endoscope, there is better and greater detection of FB and more differentiated treatment with a reduction in complications.

5. Conclusion

This is a study on FB that covers an age group that has been little studied: teenagers and adults, over a long period of time (26 years), making it an essential source for future work and the development of advocacy strategies. This study showed that most patients were students, without gender difference, with fish bones, bones and meat being the most frequent FB. Ear was the most involved location, followed by esophagus and pharynx.

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