International Journal of Medicine and Medical Sciences ISSN: 2167-0447 Vol. 2 (5), pp.108-113, May, 2012. Available online at www.internationalscholarsjournals.org © International Scholars Journals

Full Length Research Paper

The Challenges of Rigid esophagoscopy in the management of esophageal foreign bodies in Port Harcourt

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Received May 03, 2012; Accepted May 29, 2012

Background: Foreign body (FB) ingestion and impaction in the esophagus constitutes an important cause of morbidity and mortality worldwide. Most of the impacted foreign bodies in the esophagus require endoscopic removal with rigid esophagoscopy.
Objective: This study seeks to highlight the challenges in the management of esophageal FB using rigid esophagoscopy. It will also evaluate the outcome of management.
Patients and Method: This was a retrospective study of 70 patients with confirmed esophageal foreign bodies that were managed in the Ear, Nose and Throat (ENT) department of University of Port Harcourt Teaching Hospital (UPTH) and Rex Medical center Port Harcourt, from January 2006 to December 2011. The records of all patients that presented to both centers with history of FB ingestion were retrieved from admission registers, theatre records and case files. Demographic and clinical data were documented and simple statistical tables were used to illustrate the data. Data analysis was done using SPSS for windows 15.
Results: The records of 70 patients were retrieved out of 2,400 patients that presented with ENT emergencies giving a prevalence of 2.92%. The total ENT cases seen within the study period were 22,200 cases giving a prevalence of 0.32%. Fifty five patients had radiologic confirmation of foreign bodies in their esophagus and 15 were further confirmed during esophagoscopy. There were 44 males and 26 females with Male: female ratio of 1.7:1. The age range was 1- 65 years with a mean of 23.15 ± 14.24 years. Majority of the foreign bodies 60 (85.71%) were impacted in the cricopharyngeal sphincter of the esophagus. Dentures ranked highest among the adult population, 10 (14.29%) cases while, metallic objects excluding coins ranked highest in the pediatric population, 21 (30%) cases. Forty (57.14%) cases presented to the hospitals after 72 hours. Only 66 (94.29%) patients' foreign bodies could be extracted. There was failed extraction in 4 (5.71%) cases. Complications occurred in 9 (12.86%) cases. Conclusion: The management of impacted esophageal foreign bodies with rigid esophagoscopy was an effective procedure despite its challenges. Public enlightenment campaigns are necessary to help reduce the incidence and encourage early presentation to hospitals.

Key words: Esophageal, Foreign bodies, Management challenges, Perforations, Rigid esophagoscopy.

INTRODUCTION

The sword swallowers in Greece were the first group of people in 300BC whose act led to the further development of esophagoscope (Huizinga, 1969; Scheinin and Wells, 2001). Esophagoscopy makes up an indispensable part of the practice of both otolaryngologists and cardiothoracic surgeons. Today's "rigid esophagoscopy" was designed by Chevalier Jackson, who broke new grounds in aerodigestive foreign body management (Scheinin and Wells, 2001).

Foreign body ingestion is a well known occurrence worldwide. It usually presents as an emergency either to the otolaryngologists or cardiothoracic surgeons. Most ingested foreign bodies become impacted often in the

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esophagus, and have the potential to cause distress to both the patient and family members. Occasionally, foreign bodies may pass through the esophagus into the stomach without any hitch to the patient (Shivakumar et al., 2006).

Impacted esophageal foreign bodies are typically found at one of the following three normal anatomic esophageal narrowings: the level of the cricopharyngeus muscle, the level of the aortic arch, and the lower esophageal sphincter (Lowell and Barsan, 2002; Shivakumar et al., 2006). The presence of an impacted foreign body in the esophagus poses a management challenge to both the otolaryngologists and cardiothoracic surgeons. Its management depends on a number of factors, such as anatomic location, shape and size of the foreign body, duration of impaction, the surgeon's expertise and availability of appropriate instruments. Rigid esophagoscopy for the removal of foreign bodies remain the best mode of treatment. However, there are other modes of treatment reported in literature; the use of flexible esophagoscopy, cervical esophagotomy and the use of forley's catheter under fluoroscopic guidance (Athanassiadi et al., 2002; Ashraf, 2006 Imam et al., 2009).

Complications such as esophageal perforations may arise especially when the instruments for rigid esophagoscopy are inappropriate and the surgeons are inexperience (Uba et al., 2002; Orji et al.; 2012). Besides, sharp objects at any point of impaction may cause perforation before extraction. They can easily result in mediastinitis and mortality (Yee et al., 1975). Most times perforation can be avoided when foreign bodies are pulled into the scope before extraction (Nimmo et al., 1988).

Common swallowed objects reported in literature include coins, buttons, batteries, fish bones and nails (Okoye and Erefah, 2001; Weissberg and Refaely, 2007; Nwogbo and Eke 2012). However, there is paucity of information on rigid esophagoscopy in the management of foreign bodies in our setting. This study therefore seeks to highlight the challenges posed by rigid esophagoscopy in the management of impacted esophageal foreign bodies. It will also evaluate the outcome of management.

PATIENTS AND METHODS

This is a 6 years retrospective study of 70 patients with impacted esophageal foreign bodies that were managed in the ENT department of University of Port Harcourt Teaching Hospital (UPTH) and Rex Medical center Port Harcourt, from January 2006 to December 2011. The records of all patients that presented to both centers with history of FB ingestion were retrieved from admission registers, theatre records and case files. The data analyzed were age, gender, clinical presentations, impacted foreign bodies in the esophagus, types of foreign bodies ingested, investigations, treatment, and complications/challenges of management encountered by specialists. We have specialists with different years of working experience. The most senior specialist has worked for more than 5 years. Ethical approval was giving for the study by the institutions involved. Simple statistical tables were used to illustrate the data. Categorical data were expressed as mean and standard deviation. Data analysis was done using SPSS for windows 15.

RESULTS

The records of 70 patients were retrieved out of 2,400 patients that presented with ENT emergencies giving a prevalence of 2.92%. The total ENT cases seen within the study period were 22,200 cases giving a prevalence of 0.32%. Fifty five patients had radiologic confirmation of foreign bodies in their esophagus and 15 were further confirmed during esophagoscopy. There were 44 males and 26 females with Male: female ratio of 1.7:1. The age range was 1- 65 years with a mean of 23.15 ± 14.24 years (**Table 1**). Majority of the foreign bodies 60 (85.71%) were impacted in the cricopharyngeal sphincter of the esophagus. The remaining 10 (14.29%) were impacted in the level of the aortic arch. Fish bones 18 (25.71%) were the commonest foreign bodies encountered in this study (**Table 2**). Dentures ranked highest among the adult population 10 (14.29%) cases. This group of patients has worn their dentures for more than 5 years without follow up visits to their dentist. Metallic objects **excluding** coins ranked highest in the pediatric population 21 (30%) cases **(Table 3)**.

All the patients presented as an emergency, most of them have feeling of lump in the throat, dysphagia, odynophagia and neck pain. Only a few presented with difficulty in breathing. Forty (57.14%) patients presented to the hospitals after 72 hours (**Table 4**). All the patients had soft tissue radiograph of the neck (anteroposterior and lateral views) and chest. The plain soft tissue radiograph of the neck showed clearly some foreign bodies that were impacted in the esophagus **(Figure, 1 and 2).** Besides, it showed air entrapment and increased prevertebral soft tissue shadow in some of the patients with impacted dentures. Rigid esophagoscopy was performed on all of the patients under endotracheal intubation with adequate muscle relaxation. Only 66 (94.29%) patients had extraction of foreign bodies with the aid of foreign body grasping forceps. Some of the extracted foreign bodies are shown in **figure 3-6.** There was failed extraction in 4 (5.71%) cases because the foreign bodies were inadvertently dislodged into the stomach. Plain abdominal radiographs were further done for the patients with dislodged foreign bodies into the stomach to help in the further management of the

Table 1: Age distribution of patients with esophageal foreign bodies (n=70)

Age (years)	Number of cases	Percentage (%)
0-10	33	47.14
11-20	10	14.29
21-30	6	8.57
31-40	10	14.29
41-50	8	11.43
51-60	1	1.43
61-70	2	2.85

Table 2: Types of esophageal foreign bodies (n=70)

Foreign bodies	Number of cases	Percentage (%)
Keys	3	4.29
Button batteries,	6	8.57
Ornaments	4	5.71
Nails	8	11.43
Dentures	10	14.29
Toy parts (plastic)	7	10.00
Coins	5	7.14
Fish bones	18	25.71
Meat bones	9	12.86

patients. Complications occurred in 9 (12.86%) cases. They include; mucosal lacerations and primary hemorrhages in 4 cases; esophageal perforations in 3 cases and acute upper airway obstruction in 2 cases.

All confirmed esophageal mucosal injuries were successfully managed conservatively with nasogastric tube feeding and parenteral broad-spectrum antibiotics like intravenous ceftriaxone and metronidazole for the first 48 hours. Besides, the patients had post operative check radiographs of the chest to look out for features of mediastinitis before commencement of oral feeding, antibiotics and anagelsics. For the patients with esophageal perforations the nasogastric feeding tube was left insitu for a period of 10-14 days postoperatively as a rule to allow for wound healing and prevention of further complications. However, no mortality was recorded.

DISCUSSION

This study revealed that foreign body's impaction was commoner in the 0-10 age group, this finding agrees with the findings of some researchers in Jos (Adoga et al.,

Table 3: Esophageal Foreign body and age group distribution

Foreign bodies	Age group distribution (Yrs)						
	0-10	**11-20**	**21-30**	**31-40**	**41-50**	**51-60**	**61-70**
Keys	3	-	-	-	-	-	-
Buttons batteries	6	-	-	-	-	-	-
Ornaments	3	1	-	-	-	-	-
Nails	4	3	1	-	-	-	-
Dentures	-	-	3	2	3	1	1
Toy parts (plastic)	7	-	-	-	-	-	-
Coins	5	-	-	-	-	-	-
Fish bones	3	6	2	6	-	-	1
Meat bones	2	-	-	2	5	-	-

Table 4: Duration of symptoms with esophageal foreign bodies before presentation to hospital

Duration of symptom	Number of cases	Percentage (%)
Less than 24 hours	10	14.29
More than 24 hours but less than 72 hours	20	28.57
More than 72 hours but less than 1 week	25	35.71
More than 1 week	15	21.43

Figure 1: Antero-posterior radiograph of the neck of a child showing ornament in the esophagus

Figure 2: Antero-posterior radiograph of the neck of a child showing a coin impacted in the esophagus

2009). Furthermore, Okoye and Erefah in Port Harcourt in 2001found more foreign bodies impaction in the 0-5 age group (Okoye and Erefah, 2001). These studies have demonstrated that children are more prone to foreign body ingestion.

Male preponderance was found in our study and this has been noted in the past by other researchers (Okoye and Erefah, 2001; Nwaorgu et al., 2004), and more recently by Nwogbo and Eke (Nwogbo and Eke, 2012). The male predominance in our study was as a result of more male pediatric patients that had foreign bodies impacted in their esophagus. Obviously, in the pediatric

Figure 3: Ornament after removal from the esophagus of a child

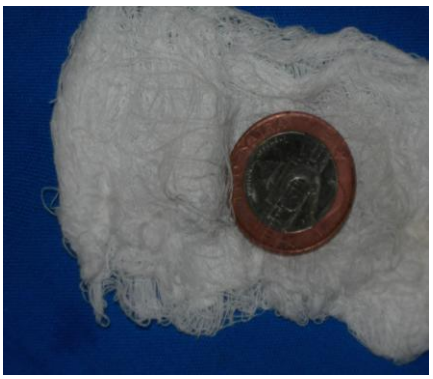

Figure 4: Coin after removal from the esophagus of a child

Figure 5: Denture after removal from the esophagus of an adult

age group male children appear to be more active and inquisitive, they tend to explore their environment more than their female counterparts, by so doing they become more prone to foreign body impaction in their orifices (Okoye and Onotai, 2006; Onotai and Ebong, 2011).

Figure 6: Button battery after removal from the esophagus of a child

Moreover, from this study toy parts, button batteries, coins and metallic objects were relatively common findings among children whereas; dentures and fish bones were common findings among the adult population. These findings do not differ from what has been reported by various researchers (Okafor, 1979; Okeowo, 1985; Okoye and Erefah, 2001; Monte, 2005; Shivakumar et al., 2006; Orji et al., 2012).

The radiographic diagnosis of FB impaction in the esophagus was found to be very useful in our study. However, it cannot be relied upon solely because some foreign bodies like tiny fish bones, plastic toy parts and dentures may not be visible. Radiolucent materials that are lodged in the esophagus in some cases may pose diagnostic challenge and give false negative results (Haglund, et al., 1978).

Majority of the foreign bodies in our study were impacted in the cricopharyngeal sphincter of the esophagus. However, in Ibadan Nigeria, Nwaorgu et al., found most of their patients' foreign bodies (dentures) impacted between the cricopharyngeal sphincter and thoraxic inlet (Nwaorgu et al., 2004). While in Jos Adoga et al., found majority of their patients foreign bodies impacted in the middle third of the esophagus (Adoga et al., 2009).

Late presentation was an outstanding factor that affected the prognosis of impacted foreign bodies in the esophagus in our study. We observed that most of our patients presented to the hospital after 72 hours of incidence and this was the group that developed most of the complications we encountered in the study. Other researchers have reported similar findings in the past (Okafor; 1979; Bhatia, 1989; Reilly et al., 1997). The reasons for the late presentation could be attributed to ignorance and poverty. Most of the patients in our setting do not consider surgery first as a form of treatment. They will only subscribe to surgery after the various means of treatment they have tried fail. Besides, by the time they present to the specialist for expert management some may have developed some sort of complications.

In planning for the extraction of foreign bodies from the esophagus one of the important points to consider is the proper choice of the instruments besides, the surgeon's proficiency. In our hospitals we did not have functional flexible esophagoscopes and as such we were left with only the option of using the rigid esophagoscopes. However, rigid esophagoscopy is particularly important in the extraction of sharp and pointed foreign bodies like nails and dentures. Extractions of these sharp objects also require special attention and expertise. They should be drawn into the lumen of the rigid esophagoscope, to enable their manipulation and extraction while protecting the esophageal mucosa (Orji et al., 2012; Roffman et al., 2002).

Unfortunately, in some of our patients with impacted dentures and sharp objects the foreign bodies could not be manipulated into the lumen of the rigid esophagoscope because they were too large. Besides, attempts made to break them into smaller parts proved abortive. Therefore, they were brought out along with the rigid esophagoscope causing mucosal lacerations, primary hemorrhages and a perforation. The decision to extract foreign bodies that could not be manipulated into the lumen of the esophagoscope by bringing them along with the esophagoscope particularly those with sharp edges appear radical knowing fully that the act posses more danger to the patient. However, a few of the cases were extracted successfully without complications. Other perforations in this study were already caused by bent nails that were pulled from the walls of the esophagus.

The use of rigid esophagoscopy in the management of impacted foreign bodies has been a challenge since its inception. However, majority of our patients had successful extraction of foreign bodies with the aid of rigid esophagoscopy without complications. Some other authorities in the past, considered cervical esophagotomy in cases that the foreign bodies could not be pulled into the esophagoscope before extraction (Athanassiadi et al., 2002; Imam et al., 2009). However, we did not consider this method more useful since we could visualize and grasp the foreign bodies.

Four of the foreign bodies (a toy part, 2 nails and a coin) were dislodged into the stomach inadvertently as the esophagoscope was being advanced into the esophageal lumen to visualize the foreign bodies. The dislodgement must have been aided by the relaxation of the muscles of the esophagus by the general anaesthesia administered with muscle paralysis. Consequently, plain abdominal radiographs were done to monitor the progress of the foreign bodies as they tend to find their way out from the stomach. Fortunately, they were finally excreted after 72 hours. A similar experience has been reported and managed effectively in Turkey where foreign bodies were dislodged into the stomach in 11 patients (Nadir et al., 2011).

Some complications typically encountered by various researchers in the past were mostly esophageal perforation, laceration of esophageal mucosal, abscess formation in the neck, pneumomedistinum and mediastinitis (Okafor, 1979, Nwaorgu et al, 2004; Khan et al., 2004).

It is important to emphasize on the challenge we encountered with button batteries. Some of the patients with impacted esophageal button batteries developed severe respiratory distress prior to presentation. Button batteries have potential for voltage burns and direct corrosive effects that usually occur very early. For these reasons, it is advisable for this group of patients to be given prompt intervention after which they should be followed-up for several weeks before discharging them from the out-patient clinic (Monte, 2005). Emergency tracheostomy was done to relieve airway obstruction for 2 of the patients who presented late with impacted esophageal button batteries before esophagoscopy. They were further managed conservatively for another 2 weeks before they were referred to another center outside Port Harcourt on account of difficulty in decannulation. They may have developed laryngeal stenosis as a result of the prolonged impaction of the foreign bodies. Unfortunately, we don't have appropriate facilities in our centers to manage them successfully.

At present the rigid esophagoscopy remains the universally preferred method of extracting foreign bodies from the esophagus with a success rate that ranged between 94% and 100% (Vizcarrondo, 1983; Chaikhouni, 1985). The anticipated incidence of esophageal perforation with rigid esophagoscopy was 0.34% with a mortality rate of 0.05% (Giordano, 1981). However, our incidence of esophageal perforations was 4.29%. This was very high compared with the finding of other researchers (Giordano, 1981; Nwogbo and Eke, 2012). The high incidence of esophageal perforation/complications could be credited to the sharp nature of some of the foreign bodies, long duration of impaction, late presentation to the hospitals and lack of appropriate facilities. However, in a study of esophageal impacted dentures in Ibadan, the researchers reported a higher incidence of 8.77% and recorded mortality in one patient (Nwoargu et al., 2004).

All esophageal mucosal injuries and perforations we encountered were successfully managed conservatively with nasogastric tube feeding, parenteral broad-spectrum antibiotics and analgesics. Patients' vital signs were monitored closely, as we looked out for clinical features of mediastinitis. They were further counseled and followed up through the out-patient clinics for several weeks (Ashraf, 2006).

CONCLUSION

The management of impacted esophageal foreign bodies with rigid esophagoscopy is an effective and safe procedure despite its challenges. Public enlightenment

campaigns are necessary to help reduce the incidence of impacted esophageal foreign bodies and encourage early presentation of patients to hospitals.

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