CHIRURGIE THORACIQUE / THORACIC SURGERY

MANAGEMENT OF IMPACTED DENTURE IN THE OESOPHAGUS: WHEN IS OESOPHAGOTOMY RECOMMENDED?

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Abstract:

Background: The use of artificial dentures has increased among Nigerian populace over the last 3 decades. There is also an increased incidence of complications from impaction of artificial dentures (IAD) in the oesophagus while literature about these complications are scant from Nigeria.

Aim: To present the challenges of management and indications for surgical intervention in patients managed for IAD in University of Ilorin Teaching Hospital, Nigeria **Method:** The records of patients who presented with foreign body in esophagus between March 2007-June 2016 were reviewed. Demographic data of all patients and summary of management of patients who required surgical intervention for IAD were extracted from their case files. The results were presented in descriptive statistics. **Results:** Thirty-nine records of foreign body in the oesophagus were found (11 females, 28 males), 10(25.6%) were IAD (1 female). The age range of all patients was 3 to 74 (mean 29.9± 23), age range of the 10 who had IAD was 29 to 74 years (mean 47.7± 16.4. Nine of the 10 with IAD had rigid esophagoscopy, while one had thoracotomy and esophagostomy without prior attempt of oesophagoscopic retrieval because of late presentation. Oesophagoscopic retrieval was successful in 7 patients, 6 of whom had IAD <20cm from upper incisor. Two patients had failed attempt at retrieval necessitating neck exploration.

Conclusion: Our series showed a high incidence of IAD in esophagus. This calls for better education of prospective users of artificial dentures. We have identified that oesophagoscopic intervention should be used with caution when IAD is deeper than 20cm from incisor.

Introduction

The teeth constitute important part in facial appearance, nutrition and social art of communication[1]. Missing teeth may result in impaired chewing ability necessitating diet selection, impaired communication and loss of normal facial contour requiring replacement with artificial dentures. Over the last three decades, the use of dentures has increased among Nigerian populace with an attendant increased incidence of complications from impaction of artificial dentures (IAD) in the esophagus[3].Yet, literature about these complications are scanty from Nigeria. In 2004, Nwaorgu et al3 in south-western Nigeria reported 22 cases over
a 16-year period, citing only a report of three cases before theirs. Alabi et al4 in Ilorin reported 6 cases of dentures in upper third of oesophagus over a 10-year period. In 2014, Adedeji et al also in south-western Nigeria reported 19 cases over a period of shorter than half of the duration of the report by Nwaorgu et al[3]. The complications of IAD depend on the size and geometry of the denture, site of arrest along the alimentary tract and duration of stay at the site of arrest [2,3]. Common complications include oesophageal necrosis and perforation[1].Recovery of IAD will be by either of two means,
including spontaneous expulsion following regurgitation/vomiting or expulsion through the anus[2] or by a form of active intervention. The best form of intervention for removal of a denture impacted in the oesophagus is controversial[5]. This article presents the challenges encountered in the active intervention for management of IAD in University of Ilorin Teaching Hospital.
The cases requiring surgical intervention were summarized giving reasons for surgical interventions. In addition, we propose criteria for retrieval by esophagostomy. It also adds a review of the literature on the management of IAD emanating from Nigeria.

Materials and Methods

The available unit records of patients who presented to Otorhinolaryngology Department or Thoracic & Cardiovascular Division of the University of Ilorin Teaching Hospital, Ilorin, North Central Nigeria, with foreign bodies in esophagus between March 2007-June 2016 were reviewed. The case files of patients who had IAD were retrieved, from where the patients' demo- graph, type of denture and outcome of intervention was extracted. The management of patients who required surgical intervention were summarized. Descriptive statistics are presented using SPSS V16 and R statistical software V3.2.2.

Results

Thirty-nine patients presented with foreign body in the esophagus during the study period, ten (27.8%) were IAD. The age range of all patients was 3 to 74 (mean 29.9± 23), the age range of the 10 who presented with IAD was 29 to 74 years (mean 47.7 (± 16.4). The whole study population included 11 females; however, only one of the 10 with IAD was a female. The records of ingested objects available in the unit records are as shown in table 1. Nine of

the patients had rigid esophagoscopy under general anesthesia with endotracheal intubation and muscle relaxation while 1 had thoracotomy and esophagostomy without prior attempt of oesophagoscopic retrieval. Oesophagoscopic retrieval was successful in 7 of the 9 patients. Distribution of success rate depending on depth of impaction is shown in figure1. Two others had failed attempt at retrieval of the denture with associated esophageal laceration necessitating neck exploration. They both had prolonged hospital stay with one of them needing a right thoracotomy and a feeding gastrostomy. The patient in whom oesophagoscopic retrieval was not attempted presented 4 months after the denture ingestion. He required a right thoracotomy be- cause of expectation of fibrosis around the IAD.

Case summaries

Case 1: A 29-year old male artisan who had dysphagia, odynophagia to saliva and dull aching re- trosternal pain, 16 hours after accidental ingestion of his upper incisor denture while feeding. He had worn the same denture uneventfully for 4years.Examination revealed tender suprasternal region and inflamed posterior pharynx. No other loco-regional or systemic examination findings. Neck and chest radiographs appeared normal. Rigid oesophagoscopy revealed IAD 20cm from the incisor. Attempt at endoscopic extraction was aborted for oesophageal exploration when the denture arrested in the hypopharynx. Oesophageal exploration via left oblique neck incision anterior to the sternocleidomastoid re-vealed 8cm longitudinal tear in the left oesophageal wall. The tear was repaired over 18Fr nasogastric tube (NGT) using single layer interrupted silk 2/0 after the denture was extracted. An open neck drain was placed. NGT feeding and oral feeding were commenced 2nd and 14th post-operative day (POD) respectively. The oral feeding was preceded by a methylene blue test demonstrating no leakage. He was discharged on 20th POD and referred to the Prosthodontist for review of denture. He remained dysphagia free 8months later.

Case 2: Fifty-two-year-old female hypertensive who had neck pain, dysphagia, odynophagia, drooling of saliva and hematemesis about1½ hours after accidental ingestion of upper central incisor denture which she had worn uneventfully for 10 years. She attempted to induce expulsion by stimulating vomiting severally but to no avail before coming to hospital. Examination revealed hyperemic posterior pharynx. She had no nuchal tenderness or crepitation; chest and abdominal examination findings were normal. Chest and neck radiographs were also normal. Rigid esophagoscopy revealed the denture in midoesophagus. Attempt at endoscopic retrieval was aborted for immediate neck exploration when esophageal laceration and partial. expulsion of denture into mediastinum occurred. Exploration revealed midoesophageal lacerations; one 7cm laceration on the right posterolateral wall and a second 0.5cm laceration of the left postero-lateral wall. The lacerations were repaired in 2 layers with 2/0 Vicryl and a prophylactic right chest tube was inserted. She developed nuchal subcutaneous emphysema and spikes of fever on 5thPOD. Suspicion of repair leakage causing mediastinitis was confirmed by gastrografin swallow. Re-exploration via a right serratus-sparring posterolateral thoracotomy revealed dehiscence of previous repaired right posterolateral laceration.

The dehiscence was repaired using 2/0 silk interrupted stitches reinforced by mediastinal pleura flap. Mediastinal and right pleural drains were placed. Appropriate antibiotics were administered for mediastinitis. Feeding gastrostomy (by a third surgical intervention) was placed after methylene blue dye test on 9thPOD revealed leakage of the repair. Oral feeding commenced after barium swallow showed no leakage or stenosis 8 weeks later. Gastrostomy and chest tubes were removed 3 months after stabilization on oral intake.

Case 3: A 73 -year old hypertensive and diabetic who had open prostatectomy a year earlier complicated by stroke and atrial fibrillation from which he recovered neurologically and regained sinus rhythm after chemical cardioversion. He presented 4 months after numerous failed attempts at inducing expulsion of accidentally ingested denture by stimulating emesis. At presentation there was dysphagia to semisolids, odynophagia and right-sided dull chest pain. Barium swallow with bread and cotton wool pledgets showed contrast hold up in the mid-thoracic oesophagus and precise localization confirmed by flexible oesophagoscopy (Fig. 2) and computerized tomography scan of the chest. He consented 2 months after presentation to oesophagotomy plus possible oesophagectomy and oesophageal replacement with full comprehension of the risks of surgery and anaesthesia. The impacted denture was successfully extracted by oesophagotomy through a right posterolateral thoracotomy.Oeso-phagus was repaired using interrupted figure-of-8 PDS suturing. Oral feeding was commenced on 12th POD after barium swallow showed no leak. Chest tube was removed 2 days thereafter. He remained symptom free 7 months after.

Ingested Object	Frequency	Percent
Denture	10	25.64
Coin	8	20.51
Fish bone	7	17.95
Metal clip	4	10.26
Small container	4	10.26
Kola nut	2	05.13
Not specified	4	10.26
TOTAL	39	100.0

Table 1: Records of ingested objects

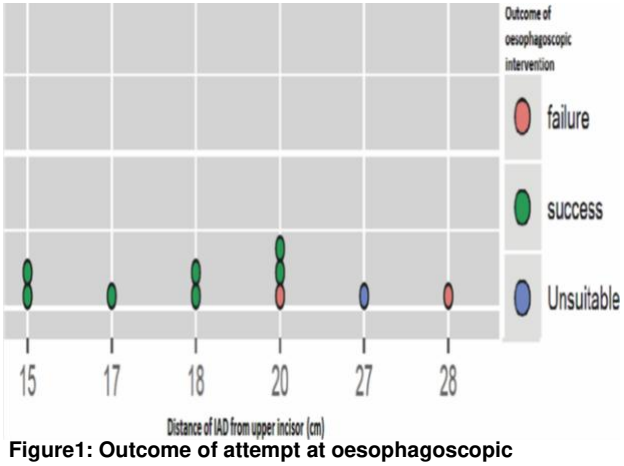

Figure1: Outcome of attempt at oesophagoscopic extraction versus distance of impaction from upper incisor

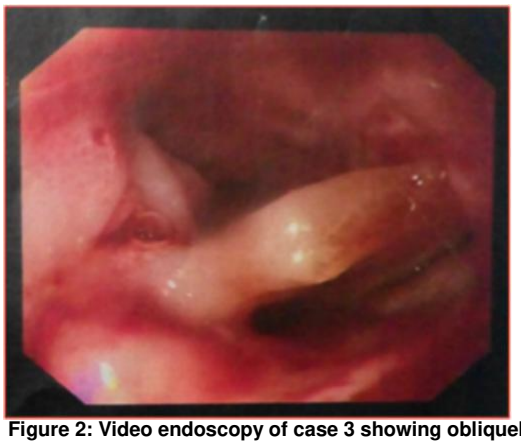

Figure 2: Video endoscopy of case 3 showing obliquely lying denture with thickened esophageal wall due to inflammation and

Discussion

Incidence of foreign body ingestion is notably higher in children[1]. They may swallow coins, parts of toys and other small materials[4,6–8]. Among adults, the more common causes are edible

substances such as meat, fish bone or co - la-nut [1,7]. Dentures are unique types of ingested foreign bodies because they bear hooks or anchors and have sharp edges which increase the associated morbidity/mortality Recent reports suggest increasing incidence of IAD. Adedeji et al in Nigeria2 reported prevalence of impacted acrylic denture in the oesophagus in the range of 1.3% - 38.6%2. A comparable value of 25% was found in this study. All the cases in this review were in adults, the sex distribution conforms to previous studies showing higher incidence in males. Although more females are likely to use dentures for cosmetic reasons, they tend to pay attention to the care of their dentures thereby reducing the incidence of complications in them[2].

Common sites of denture impaction are at anatomical narrowing along the gastrointestinal tract, at acute angulations or stenotic regions[1,9,10]. Seventy percent of IAD of gastrointestinal tract are in the oesophagus[1], the most common is the cricopharyngeal sphincter which is the narrowest portion of the esophagus [1,10,11]. In this review, 66.7% were located at the cricopharyngeal sphincter; these were successfully extracted by rigid oesophagoscope while 33.3% which were located in the mid esophagus, posed greater challenges. All 6 cases which accounted for 11.5% of impacted foreign bodies in review by Alabi et al4 were located in the upper third of the oesophagus, however modality of retrieval was not stated. In majority of cases, order than plain neck and chest radiographs, extensive radiologic investigations may not be required because the diagnosis is usually apparent from the extracted history. Only the patient who presented very late required extensive radiologic investigations in this study. Endoscopy is the gold standard for confirming the diagnosis and is commonly the first line of intervention[1]. Oesophagoscopic retrieval has a high success rate [4,12]. In this study 20% had difficult and complicated attempt at endoscopic retrieval necessitating surgical intervention; one patient was considered unsuitable for trial of endoscopic removal. The further down the site of impaction in the oesophagus, the more difficult it is to extricate the denture without perforating or lacerating the oesophagus. The ragged and sharp edges of removable, partial dentures make successful removal a daunting task. Oesophagectomy with oesophageal substitution have been performed in long standing cases with extensive fibrosis[11]. Though not encouraged, expectant management may be adopted in cases when the denture is small or in cases when it has passed into the gut especially beyond the ligament of Treitz1.Common to most cases of impacted denture is a history of loose denture [1,3]. This stem from poor dental follow up or patronizing inappropriate personnel for denture fabrication. Prosthodontists have a role in increasing public awareness on dental follow up and prompt presentation when loosening of denture is noticed. In the event that accidental ingestion occurs, immediate presentation to the ORL surgeon or thoracic surgeon with intervention less than 24 hours increases the probability of successful non-operative retrieval.

Conclusion

Our series has showed a significant proportion of foreign body impaction in the esophagus occurring as a result of dentures. We have also identified that the deeper the level and chronicity of impaction may pose greater challenges in management. Safe removal of dentures impacted further down is less probable.This calls for better education of prospective users of artificial dentures. There is need for regular follow-up with the

Prosthodontist, particularly to identify when the denture is getting loose early. We also advocate caution in the use of oesophagoscopic intervention when IAD is judged to be more than 20cm from incisors.

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