



Diagnostic and Therapeutic Strategies in Denture Removal After Ingestion in A Developing and Emerging Country – Nigeria

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Abstract

Objective: Impaction of dentures in the esophagus with the associated complications is occasionally encountered in Ear, Nose, Throat, Head and Neck surgical practice. This article was aimed at highlighting the diagnostic and therapeutic strategies that aided successful removal.

Materials and Methods: It was a prospective observational study that was carried out at the University of Benin Teaching Hospital, Nigeria, between January 2009 and December 2010. All patients who ingested a denture during this period of study were recruited, and their demographic parameters, presenting features, duration of ingestion before presentation, surgical procedure, outcome, and associated complications obtained.

Results: Eight patients: 7 males and 1 female experienced denture ingestion during this period of study. Difficulty in swallowing and the 'pointing sign' were the main diagnostic symptoms and signs elicited respectively. The duration of ingestion before presentation at the hospital varied from 1 hour to 1 week, with complications associated with longer duration of presentation. Quick, tactical and highly specific rigid esophagoscopy procedures were important therapeutic strategies that led to successful removal of the ingested denture.

Conclusion: Difficulty in swallowing, the 'pointing sign' and tactical rigid esophagoscopy were the diagnostic and therapeutic strategies that aided denture removal from the esophagus.

Key words: Diagnostic, therapeutic, strategies, denture removal, esophagoscopy

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Introduction

Cases of impaction of foreign bodies in the esophagus are fairly common in Ear, Nose, Throat, Head and Neck (ENTH&N) surgical practice. Impacted dentures accounted for 11.5% of foreign bodies in a series [1] where ingestion occurred after trauma, intoxication, loss of consciousness or sleep. If a definite history of ingestion of a denture is not obtained from the patient, there may be difficulty in making a quick diagnosis. A good history taking as well as attention to all details in the examination and

investigation of the patient are necessary for early diagnosis and treatment to avoid associated complications or even mortality. A death from ingestion of a removable partial denture was reported from our center in 2005 [2].

Common locations for impaction of a denture are usually at the cricopharyngeus or at sites of narrowing from previous pathologies like scarring from a burn or peptic stricture [3]. Complications of failure to diagnose impacted dentures include severe hematemesis [4], perforation of the

esophagus, trachea-esophageal fistula, entero-colonic fistula, sigmoid colon perforation, retropharyngeal and mediastinal abscess, luminal stenosis, and death [5-7]. Therefore, it follows that the ability to make a diagnosis and remove the denture by esophagoscopy is of paramount importance. It must, however, be stated that experience is not only needed to remove the impacted denture, but is also needed for the removal to be done without likely complications of perforation of the esophagus, mediastinal injuries or even death on the operating table.

This article was, therefore, aimed at highlighting the diagnostic and therapeutic strategies that aided successful removal of the dentures in our hospital. It is hoped that this article will be a guide to ENTH&N surgeons operating in a part of the body that is fraught with diagnostic and therapeutic dilemmas and mishaps [8].

Materials and Methods

This was a prospective observational study that was done at the University of Benin Teaching Hospital (UBTH), Benin City, between 1st of January, 2009 and 31st of December, 2010. All patients with the history of ingestion of dentures were evaluated for inclusion into the study. The presenting symptoms were taken and signs elicited to aid diagnosis in all the patients. Routine X-rays of the soft tissue of the neck as well as a quick, tactical and highly specific rigid esophagoscopy for the foreign-body removal were also done in all the cases. Other data retrieved from the patients included age, sex, type of ingested denture, and duration of in-

gestion before presentation at the UBTH, Benin City. The X-ray findings at presentation, outcome of surgery and complications associated with the denture removal were also ascertained. Approval for this study was granted by the Institutional Research and Ethics committee. The data were analyzed manually, presenting the results in tabular formats.

Results

There were 8 patients in this study: 7 males and 1 female. The ages ranged from 35 years to 85 years, with a mean age of 61.13 years. The main diagnostic clinical features were difficulty in swallowing, 'pointing sign', pain in the cervical region, and others (Table 1).

Table 1. Patients' features at presentation.

Cases	Features
1	Dysphagia to solid, mild pain on swallowing saliva.
2	Anterior neck tenderness.
3	Pain and discomfort in 3rd cervical vertebra. Feeling of foreign-body sensation in the throat. Pointing sign at level of the hyoid bone.
4	Pain in the throat and difficulty in swallowing.
5	Difficulty in swallowing solids and liquids, and difficulty in breathing following aspiration.
6	Severe, sharp chest pain, difficulty swallowing solids and liquids, and lower-neck tenderness.
7	Feeling of hanging object in the throat, pointing sign positive, and neck tenderness.
8	Difficulty in swallowing solids and liquids, pain on swallowing, dyspnoea, hoarseness, and pointing sign.

The X-rays of all the patients show a significant increase in the pre-vertebral soft-tissue space and/or air-entrapment/air-fluid level in the esophagus.

Table 2. Type of denture, duration of ingestion before presentation, surgical outcome, and complications.

SN	Type	Duration	Outcome of Surgery	Associated Complication
1	1-tooth denture	1 week	Failed removal at 1st op, removed at 2nd op	None
2	Lower-jaw denture	1 hour	Removed	None
3	4-teeth denture	9 hours	Not seen at op, passed in stool.	None
4	Not indicated	24 hours	Seen at op, but slipped into stomach.	None
5	3-teeth lower incisor denture	3 days	Removed	Aspirated, developed aspiration pneumonitis
6	Upper-right central incisor denture	Few hours	Removed	None
7	3-teeth upper-jaw denture	2 hours	Removed	None
8	2-teeth upper-left lateral incisor and canine	5 days	Sheared with forceps, and removed in 2 parts	Failed ETI, had tracheostomy, hemothorax, AP, SE

op. – operation; ETI – Endotracheal Intubation; AP – Aspiration Pneumonitis; SE – Sub-cutaneous Emphysema.



Figure 1. X-ray of soft tissue of the neck of a patient with esophageal denture impaction. The arrow indicates the point of impaction.



Figure 2. Photograph of a 1-tooth denture that was removed from one of our patients.

Varied types of dentures were impacted in patients that presented between one hour and one week after ingestion of the denture (Table 2).

Four (4) out of the 8 cases of denture ingestion were easily removed on the first attempt, while the others had issues during removal (Table 2).

Although there were no complications in 6 patients, the other 2 cases had aspiration pneumonitis and other complications (Table 2) associated with ingestion of dentures.

Figure 1 showed an X-ray of the soft tissue of the neck of one of our patients, with an arrow indicating the point of impaction. Figure 2 is a photograph of a piece of denture that was removed from one of our patients.

Discussion

The mean age for the patients with impacted dentures was 61.13 years, showing a shift toward the older age group that are more likely to be wearing a worn denture from duration of use and likely to be careless regarding maintenance and care of their denture. The usual presenting symptoms are outlined in table 1, with difficulty in swallowing being the commonest symptom and the 'pointing sign' (where a patient points with the index finger at the point of impaction in the neck) being the commonest sign. It is also noteworthy that in all the patients, routine X-rays revealed a significant increase in the pre-vertebral soft-tissue space and/or air-entrapment/air-fluid level at the level of impaction in the esophagus (Figure 1). These were the main features that aided early diagnosis in the patients.

The duration of impaction of the denture in the esophagus before presentation in the hospital (Table 2) is quite important, as prompt management of all pharyngo-esophageal foreign bodies results in a better outcome and reduced complications, and vice versa [7,9,10]. This was demonstrated in this series, where the first patient presented after 1 week and had two sessions of esophagoscopy before removal of the denture was effected (Table 2). Also, the 8th patient presented after 5 days and the resultant esophageal mucosal edema prevented easy removal until the denture was sheared with shearing forceps, as is occasionally done with a transversely wedged denture. Furthermore, the 8th patient also had subcutaneous emphysema of the anterior neck wall (indicating some degree of esophageal perforation), aspiration pneumonitis, hematemesis, and had an emergency tracheostomy (as the resultant esophageal mucosal edema occluded the lumen of the closely anteriorly related airway) [7] (Table 2). The patients that had surgical intervention within hours of ingestion of the denture had neither difficult surgeries nor complications associated with the surgeries (Table 2).

All the patients had esophagoscopy, with a rigid esophagoscope with successful removal being used in 6 out of the 8 cases. The removal of foreign bodies and visualization using a rigid esophagoscope is better compared to using a flexible esophagoscope [11]. It is essential to note that the rigid esophagoscope was NEVER forced while the esophagus was contracting and it

was never advanced except when there was a distinct lumen ahead in our patients [12]. All the endoscopists had earlier observed and assisted in a number of esophagoscopies for ingested/impacted dentures before attempting to remove any for these patients. It must be remembered that many abnormalities occur in the esophagus and unless gentleness, patience and accurate, conservative judgement are exercised, as was done in all these cases, perforation of the esophagus will likely result [12]. The patients usually had insertion of a naso-gastric tube after removal of the denture, to stent the esophagus as well as to serve as a feeding channel to temporarily dysfunction the esophagus. Although no perforation following esophagoscopy occurred in this series, an overall perforation rate in rigid esophagoscopy is about 1%. In a series with 50 esophageal perforations [13], 52% were iatrogenic and it was more common in the thoracic esophagus (54%). Esophageal perforation, although an emergency with significant morbidity and mortality, can be managed conservatively, with surgical exploration reserved for unremitting cases [10]. With increasing awareness of health-related issues through the Internet and patients becoming increasingly conscious of their rights, litigations are more likely to arise when there is either a delay in recognizing the perforation or a poor management protocol after it has been recognized [14].

Conclusion

Difficulty in swallowing, the 'pointing sign' and highly specific and tactical rigid esophagoscopy were the diagnostic and therapeutic strategies that aided denture removal from the esophagus.

Conflict of interest statement

The authors have no conflicts of interest to declare.

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