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Case Series

Swallowed dentures in thoracic oesophagus

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ABSTRACT

Oesophagus is the second most (46.8%) common site of impaction of foreign body in the gastro-intestinal tract. Dentures constitute the 3rd most common (2.4%) foreign body in oesophagus of adults, following meat bone (76.1%) and coin (3.6%). In our Institute, impacted dentures in esophageal are referred to our department after a failed endoscopic venture at removal by ENT surgeons. Extraction in such a situation calls for judicial planning and careful timing of the procedure to achieve satisfactory results. The present study was done on 11 cases of thoracic oesophageal dentures which were removed surgically in the Department of CTVS Medical College and Hospital, Kolkata over 2 years of period. Between 1st October 2017 to 30st September 2019, 11 dentures were extracted from thoracic oesophagus via right postero-lateral thoracotomy approach. The defect in the oesophagus after denture removal was primarily closed; with reinforcement using intercostals muscle pedicled flap. A defunctioning cervical oesophagostomy and a feeding jejunostomy (FJ) were done in all cases. Surgical leaks were noted in 5 cases, of which 1 lady had fulminant mediastinitis before she died. Pneumonia was observed in 4 cases, superficial surgical wound infection in 2 cases, blocked FJ tube in 1 case and leakage following closure of cervical oesophagostomy in 3 cases. Thoracic esophageal dentures are serious surgical entities which need early diagnosis and management. Pre-operative optimization is very important for avoiding surgical leakage.

Keywords: Denture, Oesophagus, Feeding jejunostomy

INTRODUCTION

Dentures constitute the 3rd most common (2.4%) foreign body in oesophagus of adults, following meat bone (76.1%) and coin (3.6%).[1] Commonest site of impaction of denture in the gastro-intestinal tract is oesophagus.[2] Abdullah et al and Telford et al showed that swallowed dentures accounted for 11.5% and 38.5% respectively, amongst all cases of foreign bodies in oesophagus.[3,4] Loose dentures are common foreign bodies in elderly patients and they frequently get impacted due to the presence of hooks and pointed sharp edges, requiring surgical removal.[5] Conservative treatment is not recommended for impacted dentures in oesophagus because of high rate of complication associated with it (3.2% at 24 hours to as high as 23.5% after 48 hours).[6] In this study 11 cases of impacted swallowed dentures in thoracic oesophagus, which were not suitable for endoscopic removal and were managed surgically were presented.

CASE SERIES

In this series, 11 cases of swallowed dentures lodged only in the thoracic part of the oesophagus which were referred from the ENT Department to the Department of CTVS Medical College and Hospital, Kolkata between 1st October 2017 to 30st September 2019 (2 years period) were studied. All these cases were referred to after a failed attempt at endoscopic extraction.

During the study period, a total of 14 cases of swallowed

dentures in oesophagus were included. Of them 3 were in cervical oesophagus. All 3 were impacted in the wall of oesophagus and could not be removed on rigid oesophagoscopy. They were taken out by a left sided cervical oesophagostomy and feeding jejunostomy (FJ) was done in all for nutritional purpose. These 3 patients were discharged on 7th POD with the FJ in situ for feeding. 2 were readmitted after 6 weeks for closure of the cervical oesophagostomies and in 1 case the oesophagostomy closed spontaneously. These 3 cases are being excluded from our series. Rest 11 cases of only thoracic oesophageal denture are being reported.

The mean age of the patient population was found to be 62.09±10.49 years. There were 8 males and 3 female patients. All of them were using loose fitting partial dentures and most of them (45.45%) presented between (6-8) days of swallowing it. Dysphagia and dehydration were present in all our cases. Tachycardia, fever, sore throat, retro-sternal pain, pooling of saliva in oropharynx and surgical emphysema were among the other presenting features (Table 1).

Table 1: Patient presenting features (n=11).

Variables	Number	%
Age (years)		
41-50	1	9.09
51-60	3	27.27
61-70	5	45.45
71-80	2	18.18
Mean age	62.09±10.49	
Gender		
Males	08	72.7
Females	03	27.3
Male:female ratio	2.7:1	
Time elapsed after ingestion of denture (days)		
0-2	02	18.18
3-5	03	27.27
6-8	05	45.45
9-11	01	09.10
Symptoms		
Dysphagia	11	100
Sore throat	04	36.36
Retro-sternal pain	03	27.27
Fever	02	18.18
Signs		
Dehydration	11	100
Tachycardia	05	45.45
Pooling of saliva in oropharynx	03	27.27
↑ temperature	02	18.18
Surgical emphysema	02	18.18

All the 11 cases of dentures in thoracic oesophagus were prepared in a predesigned proforma that constitutes detailed history of all patients. X-ray chest in every case was done and CT-scan of thorax was done in cases where X-ray did not show the denture. Routine blood investigations and ECG were done. Those patients with a serum albumin <3.5 gm/dl were optimised nutritionally by a FJ preoperatively. They were taken up for surgery, once their serum albumin was ≥3.5 gm/dl. It was observed that, 8 out of 11 patients (72.70%) had pre-operative serum albumin ≥3.5 gm/dl, who could be taken up for surgery.

Table 2: Complications following surgery (n=11).

Complications	Number	%
Post repair leakages in thoracic oesophagus		
Surgical leaks which healed spontaneously	04	36.36
Surgical leaks causing fulminant mediastinitis	01	09.09
No leaks	06	54.54
Other complications		
Pneumonia	04	36.36
Leakage after closure of cervical oesophagostomy	03	27.27
Superficial surgical wound infection	02	18.18
Blocked/displaced feeding jejunostomy tube	01	09.09

Table 3: Time period of stay in CTVS department.

Time period in CTVS department	Number of days
Stay in CTVS department for denture removal	
Lowest	02
Highest	35
Mean±SD	22.45±12.37
Stay in CTVS department for cervical oesophagostomy closure	
Lowest	08
Highest	12
Mean±SD	09.80±01.55

In the remaining 3 patients, FJ was done to nutritionally optimise the patients preoperatively. Interestingly, it was noted that only 3 of the 11 dentures (27.30%) were visible on X-ray (identified by the metal clasps of the denture), rest needed CT-scan for detection. All the patients had loose fitting partial dentures.

In all 11 cases, that dentures were impacted at 25-30 cms from the upper incisor teeth (those dentures impacted higher up in cervical oesophagus, as mentioned previously, were not included in the study).

Surgical procedure

A rigid oesophagoscopy was done in every case in an attempt to extract endoscopically. This was followed by a postero-lateral thoracotomy via the 5th intercostals space

for cases which could not be extracted (in all the patients an approach in the oesophagus from the right side was done). Now the dentures were extracted by direct longitudinal incision at the site of their impaction (Figure 1). The oesophageal defect was repaired with full thickness interrupted (3-0) vicryl sutures. The repaired area was further reinforced by buttressing intercostal muscle pedicled flap from 5th intercostals space (Figure 2) in every case. A nasogastric tube was then inserted to avoid gastric distension in the post-operative period. After this, in order to meet nutritional requirements a feeding-jejunostomy (if not present previously) was done. Lastly, a proximal defunctioning cervical oesophagostomy on the left side of neck was done. Then two intercostals drains (one apico-anteriorly and one postero-basally) before closing the right postero-lateral thoracotomy was kept. Dentures were handed over to the party (Figure 3).

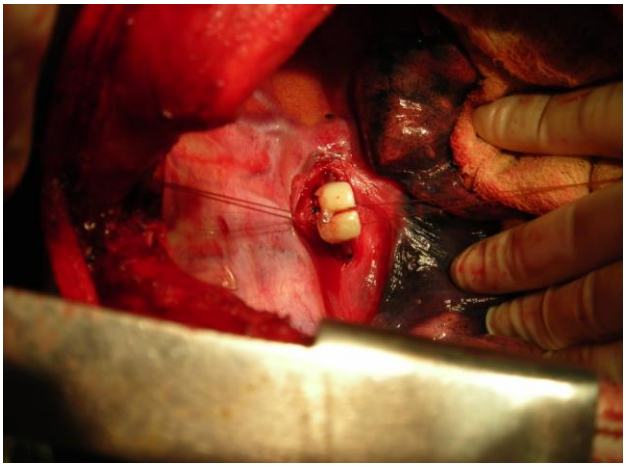

Figure 1: Denture being extracted from oesophagus after direct incision over the site of impaction.

Figure 2: Intercostal muscle pedicled flap being harvested.

Post-operative care

All patients were put 'nil orally' for (10-14) days after operation. IV fluids were continued for 1st 48 hours. Jejunostomy feed was started from 3rd post-operative day (POD). Patient were asked not to swallow his/her sputum as far as practicable. Care of cervical oesophagostomy was taken by dressing it with normal saline and Siloderm cream (zinc oxide, calamine, cetrimide, dimethicone) twice daily. It was kept covered with absorbable pads, which were changed when wet. Complete haemogram, urea/creatinine and liver function test was done on 1st POD in all the patients. Chest X-ray was done on 3rd POD and contrast oesophagogram was done on the 10th POD. If no leak was evident in this oesophagogram, then the patient was allowed to take orally (first liquids, followed by semisolids and finally solids). Patients were discharged home on the 3rd or 4th week after operation with the cervical oesophagostomy and the FJ. Patient was again readmitted 6 weeks after discharge, for closure of cervical oesophagostomy (Figure 4). The FJ was removed after the neck wound healed satisfactorily.

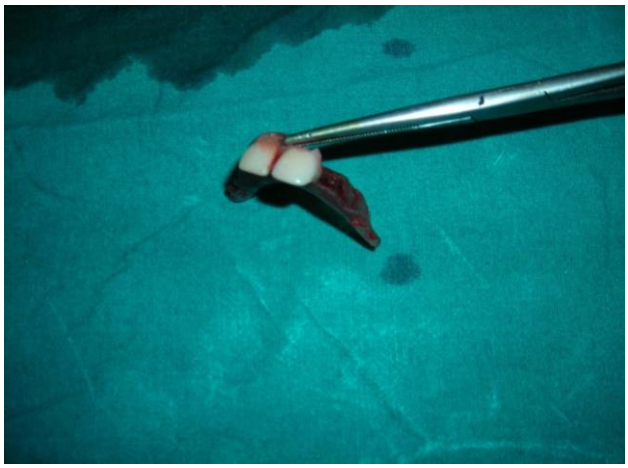

Figure 3: Extracted denture.

Figure 4: Result after closure of cervical oesophagostomy.

It was noted that 5 patients had surgical leakages of their oesophageal wounds. However, 4 of them were only minor leaks which healed spontaneously and 1 caused

fulminant mediastinitis, ultimately leading to death of the patient. This only mortality in the series was a 65 years old lady, who presented us late (on the 9th day after ingestion of a loose-fitting partial denture); with oesophageal perforation. Even though her pre-operative serum albumin was 2.7 gm/dl, early surgery was done to her after partial optimisation. She expired on the 7th POD due to fulminant mediastinitis. Table 2, shows the various complications observed in the patients.

DISCUSSION

Early detection and appropriate management are very important for swallowed denture in oesophagus. The ingested denture may get stuck at various levels of natural narrowing in the oesophagus, like at cricopharyngeus muscle of the upper esophageal sphincter, the level of the aortic arch, the level of the left mainstream bronchus, and the lower esophageal sphincter.[7] Endoscopic extraction of oesophageal denture can be difficult and may lead to perforation. The main factors responsible for this are size of the denture, rigidity, sharp edges of the denture, attempting extraction in less than ideal situations and the degree of periesophagitis at the site of impaction.[2] Those dentures which have metal parts (like pins, wires or clasps) can be seen easily on X-rays. If the denture is impacted in the oesophagus, X-ray may show air entrapment around the denture or increase in the prevertebral soft tissues, more so, when a local inflammatory response has set in.[8] Acrylic dentures are radiolucent and are often invisible on X-rays due to absence of metal parts. Such dentures may be detected by CT scan.[9] They may also be detected with MRI. However, MRI is contraindicated in dentures with metal parts in it.[10] Out of a total of 11 cases in our study, only 3 dentures could be seen on X-ray due to metal parts in them. Rest 9 were radiolucent and detected on CT scan.

Nwago et al, advocated immediate oesophagostomy and surgical removal following a single unsuccessful attempt at oesopagoscopic removal of foreign body in oesophagus.[11] Keszler et al, suggested that persistant attempts at forcible endoscopic extraction of denture oesophagus eventually results in perforation.[12] In concurrence to this, surgical extraction after a single unsuccessful attempt of oesophagoscopic removal of denture was advocated in this study.

Healing after extraction of denture by surgical incision on oesophagus and primary closure of the defect may not be satisfactory and cause leakage due to various reasons like segmental nature of blood supply in oesophagus, absence of a serosal covering, and the lack of a nearby structure (e.g. omentum) to reinforce the closure. Historically in 1951, Penton and Brantigan first used a pedicle graft consisting of intercostal muscles with the neurovascular bundle for repairing intrathoracic structures.[13] Use of pedicle graft of intercostal muscle with the neurovascular bundle to reinforce the primary closure site on the thoracic oesophagus offers several advantages, like it is readily available, it can be fashioned to almost any desired length, the graft is viable, with an excellent blood supply, it is not likely to slough or become a source for bacterial infection even in contaminated wounds.[14] In all the cases intercostal pedicle graft, which consisted of the intercostal muscles and neurovascular bundle from the fifth intercostal space was used.

CONCLUSION

Thoracic esophageal dentures are serious surgical entities which need early diagnosis and management. Pre-operative optimization (serum albumin ≥3.5 gm/dl) is very important to avoid complications like surgical site leakage and mediastinitis. Defunctioning cervical oesophagostomy, with primary surgical repair using interrupted (3-0) vicryl sutures, along with buttressing of 'intercostal muscle pedicled flap' at the site of repair is a safe technique yielding satisfactory result.

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