

## Management of Esophageal Perforation by Impacted Foreign Body: Experience in Our Centre

M. Karthikeyan<sup>1\*</sup>, R. Prabhakaran<sup>2</sup>, M. Gnanasekar<sup>3</sup>, M. Sivakumar<sup>4</sup>, Naganath Babu Obla<sup>5</sup>

<sup>1</sup>Senior resident, Department of Surgical Gastroenterology, Tirunelveli Medical College, Tirunelveli

<sup>2</sup>Associate professor, Department of Surgical Gastroenterology, Madras Medical College

<sup>3</sup>Assistant professor, Department of Surgical Gastroenterology, Kilpauk Medical College

<sup>4</sup>Assistant professor, Department of Surgical Gastroenterology, Madras Medical College

<sup>5</sup>Professor, Department of Surgical Gastroenterology, Madras Medical College

Received: 25-10-2023 / Revised: 23-11-2023 / Accepted: 26-12-2023

Corresponding Author: Dr. M. Karthikeyan

Conflict of interest: Nil

### Abstract:

**Aims:** The treatment of perforating esophageal foreign body impaction is complex and unclear. We present the outcome of surgical treatment of esophageal perforations due to foreign body.

**Methods:** During our study period, 4 cases of esophageal perforations due to foreign body ingestion were referred to our tertiary care center. We analyzed the FB types, lodging duration and location, complications, and the surgical approaches.

**Results:** There were 4 patients. Mean age was 52 years. Three cases had dentures of variable sizes, and 1 had fish bone. All patients presented with perforations. Out of the four cases which has been described three of them got perforation in the upper oesophagus and one in thoracic oesophagus. One patient presented with emphysema. One patient underwent thoracotomy, two underwent neck incision and one sternocleidomastoid incision. All the patients were discharged uneventfully.

**Conclusions:** Esophageal perforation following foreign body ingestion is rare and requires prompt treatment. Management of esophageal perforation will be difficult especially if it is due to foreign body. Management ranges from conservative to surgical treatment. . Surgical treatment tailored to the needs of individual patients is associated with a successful outcome and decreased morbidity. Here we are describing our experience in esophageal perforation due to foreign body and their management in our center.

**Keywords:** Esophagus, Perforation, Foreign Body.

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### Introduction

Esophageal perforation is defined very well in literature but its management will be difficult due to location of esophagus within thorax and the complexities of surgery involved. Management not only depends on location of perforation within esophagus but also its timing of presentation to hospital after perforation. Most common cause of esophageal perforation is iatrogenic [1] which constitutes 70%.

Most of these cases are due to endoscopic intervention. Other causes include spontaneous perforation, foreign body, trauma which constitutes only minor percentages [2,3]. We herewith present our experience in the management of four esophageal perforation cases due to foreign body.

Foreign body ingestion is a common problem among all age groups. Some of the ingested foreign bodies are particularly harmful and life threatening

such as button batteries, magnets, sharp pieces of metal and bones [4,5]. Coins are the most commonly ingested foreign bodies (FBs) and account for 70% of the ingested FBs in children [6]. The anatomic sites of constrictions in the esophagus, are the common locations for foreign body impaction (FBI). If the FBs reach the stomach and intestines, they often, tend to pass spontaneously [7]. Esophageal FBs are commonly removed by the endoscopic methods. The endoscopic approaches use either the flexible fiber optic or the rigid esophagoscope. Open surgical treatment may be unavoidable in cases of failure of the endoscopy or in the presence of esophageal perforation. The treatment of FBI associated with esophageal perforation is complex and there is scarcity of the literature available on the management protocols<sup>8</sup>. This report describes the

management and outcome of esophageal FBI with perforations.

#### Methods:

During a period of 2 years from 4 cases of esophageal perforations due to FB ingestion were managed by our surgical unit in our institute. After undergoing unsuccessful flexible esophagoscopy, the patients were referred for rigid esophagoscopy and removal of FB.

These patients underwent rigid esophagoscopy with immediate or delayed surgical intervention. We analyzed FB types, lodging, duration, location, complications, and surgical approaches.

#### Case Reports

##### Case 1:

A 28 year old man came to our emergency department with four days history fever, pain and swelling in the left side of the neck. Symptoms started and gradually increased after he ate chicken bone before four days. There was erythema, edema,

crepitus and tenderness on the left neck. He was clinically stable and his blood reports were within normal limits. His x ray neck showed bone piece with air pockets surrounding it. A decision to explore was made. Oblique incision was made along the anterior border of the left sternocleidomastoid muscle.

Through above incision investing layer of deep cervical fascia opened and superior belly of omohyoid cut. Blunt dissection along the plane medial to the carotid sheath carried out. There was an abscess in the retropharyngeal space on the left with slender 2 cm long piece of chicken bone perforating the lateral wall on the left side and protruding laterally with abscess in the retropharyngeal space on the left side. Pus drained and the piece of chicken bone removed. Esophageal perforation site edges trimmed out and sutured. Ryle's tube placed and fixed to the nose. Skin wound closed. Post-operative period uneventful.

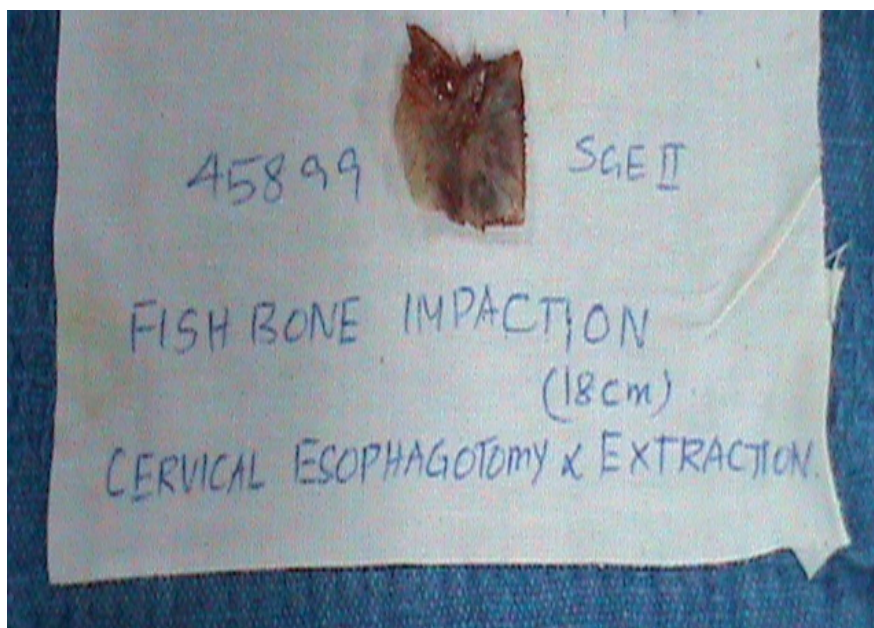


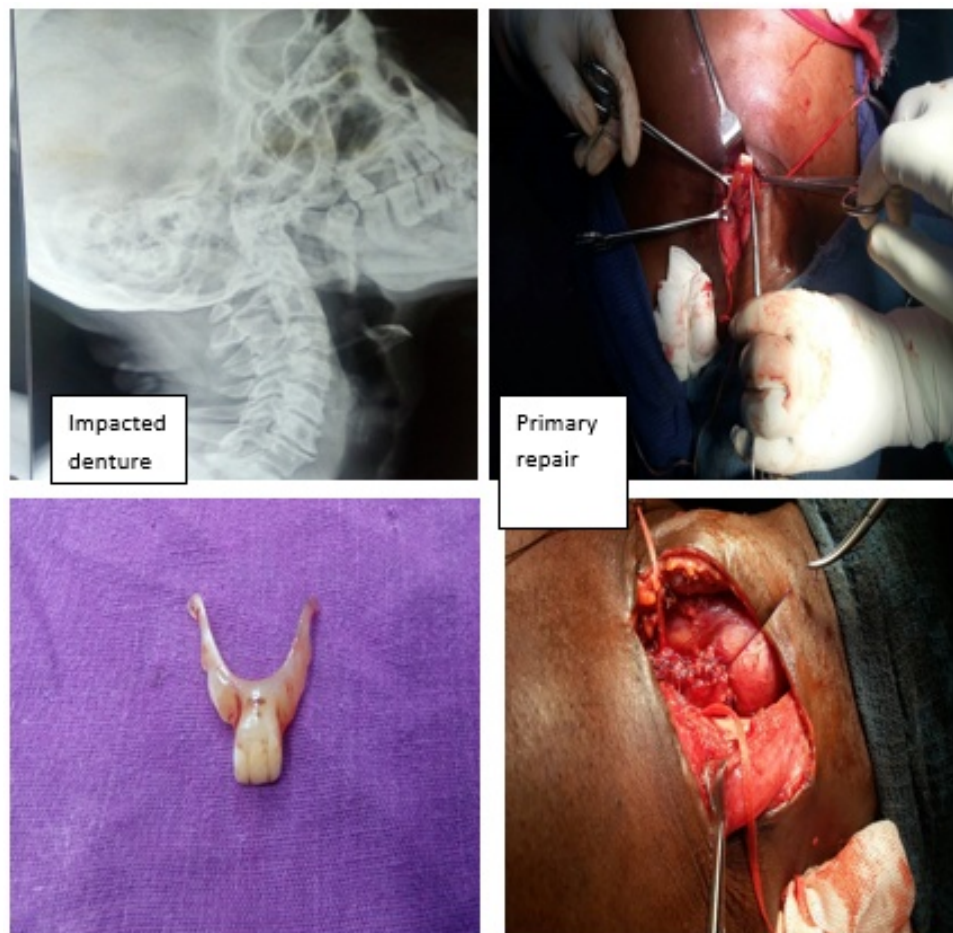
Figure 1:

##### Case 2:

Second case was a 60 year old male patient who presented with history of accidental swallowing of denture. He presented with history of pain and difficulty in swallowing. Clinical examination shows tenderness in the left neck. X ray neck shows air pockets but the denture is not visible since it is radiolucent. He was explored by using neck incision. After the neck incision, layers

dissected middle thyroid vein identified & ligated. Esophagus identified, dissected & hooked out, foreign body perforated site seen.

Esophagostomy done, foreign body removed, then esophagostomy closed using 3 0 vicryl sutures in interrupted manner. Perforated part also closed using 3-0 vicryl. Wound wash given; Neck incision closed using 3-0 polyamide sutures. Post-operative course uneventful.



**Figure 2:**

### Case 3:

A 56 yr old male patient had accidentally ingested denture and was immediately taken to nearby hospital. Under ETGA Scopy was done - @ 32cm, a full thickness tear in anterior wall of esophagus was noted with the FB partly protruding into hemimediastinum. Extent of tear could not be made out. Endoscopic retrieval attempted but failed. He was then referred to our emergency department with severe retrosternal pain, breathlessness.

He got tachycardia, tachypnoea, and surgical emphysema over neck and chest, air entry diminished in both lower chest, but his abdomen is soft. Ct thorax was taken which showed subcutaneous emphysema in neck, B/L pneumothorax, B/L lower lung consolidation, pneumomediastinum and Air around great vessels. He was planned for surgery and Rt thoracotomy was made through 5<sup>th</sup> ICS. Intraoperative findings include, 5cm perforation in the lower thoracic esophagus, Denture seen protruding through Lt

antero-lateral wall of the esophagus with minimal fluid collection around perforation site. Removal of denture with primary closure of esophageal perforation was done.

Bilateral chest drains were inserted along with feeding jejunostomy for nutrition. Post operatively chest drain outputs were high with purulent discharge starting from post-operative day 4. Oral gastrograffin study which was done on post-operative day 6 showed esophageal leak. A decision to manage him conservatively was made since the leak was controlled one without much of contamination.

CT chest done on post-operative day 12 showed localized pyopneumothorax on right side, with chest drain in situ. He was on feeding jejunostomy for nutrition. Repeat contrast study done after 4 weeks showed no esophageal leak. An OGD scopy at 2 months was also normal and patient started on oral feeds.

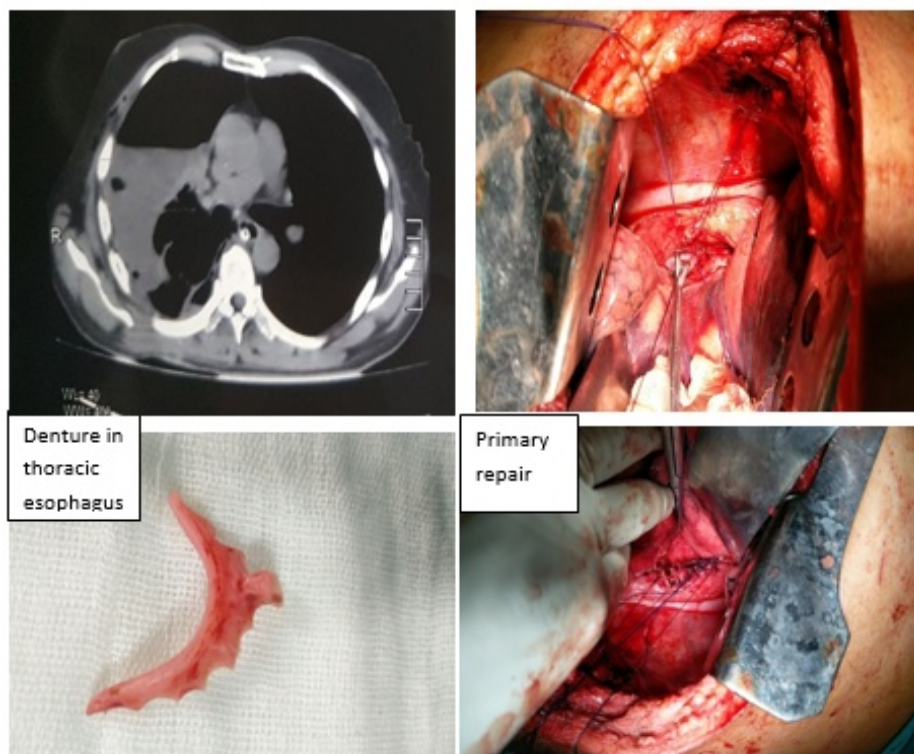


Figure 3:

**Case 4:**

A 65 year old male admitted with complaints of difficulty in swallowing and pain in the neck after swallowing denture. Endoscopy shows presence of denture at 18 cm for incisor. Endoscopic removal of perforation was tried but failed. Patient developed subcutaneous emphysema in the neck. X ray neck showed presence of air pockets around denture in cervical esophagus and so decision to

explore was made. Neck explored through left neck incision.

Denture was seen protruding through left lateral wall of esophagus with 1 cm perforation. Esophagostomy, denture removal with primary repair of esophageal tear after trimming the edges was made. Ryle’s tube inserted past the repair. Post-operative course was uneventful and the patient was orally started on post-operative day six.

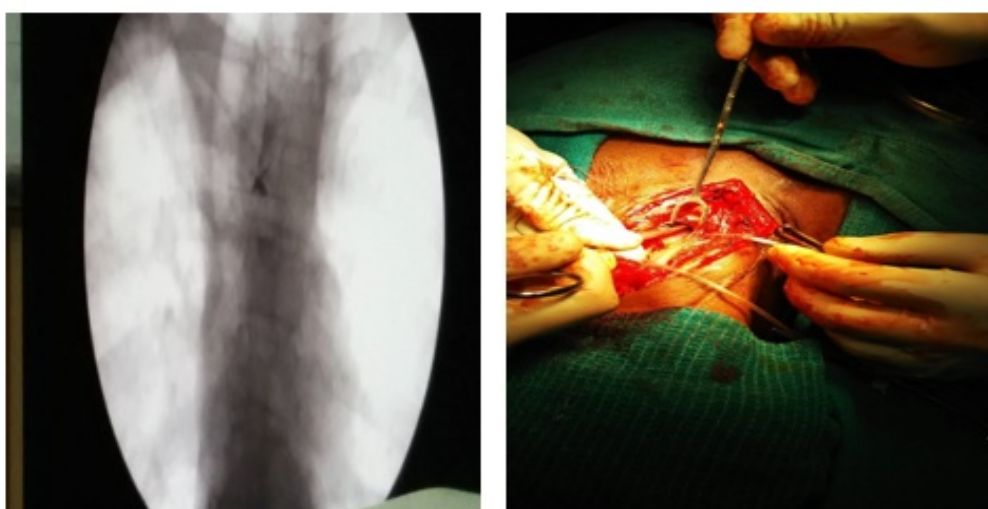


Figure 4:

**Discussion**

Oesophageal perforations are most commonly iatrogenic [1-3] which constitutes 70 % of cases.

Spontaneous, foreign body and trauma constitutes rest. Death associated with oesophageal perforation will be very high if early diagnosis and proper

management is not given. Oesophageal perforation due to foreign body accounts for about 7- 14% in the literature, which can occur due to direct penetration, pressure necrosis or during removal [9]. Oesophageal perforation due to foreign body usually occurs in the proximal third and iatrogenic perforation usually occurs in the middle or distal third of esophagus [10].

Majority of foreign body accidentally ingested will pass spontaneously without any difficulty but in around 10- 20% some form of intervention is needed [11]. Mostly the foreign body gets impacted at the constrictions in the esophagus [12]. Foreign body that does not pass spontaneously can be managed endoscopically or surgically but if the foreign body is already impacted to oesophageal wall endoscopic removal will be a failure and most of these times some form of surgical procedure is needed. There is no proper consensus or guidelines for management of impacted oesophageal foreign body.

Most of the patients with foreign body impaction in oesophagus will come with history of dysphagia, dyspnoea if the foreign body has perforated and caused mediastinitis and also other features of sepsis. Clinical features may develop immediately or also sometimes late due to gradual erosion of oesophageal wall. Most common symptom associated will be pain and dysphagia [9]. Another most important clinical finding that suggests perforation is subcutaneous emphysema which should be carefully noted while examining such patients.

A number of investigations are available for proper evaluation of the location of foreign body and presence or absence of perforation. X ray for both neck and chest is the basic investigation to start with and if it shows features suggestive of perforation with an impacted foreign body using insoluble and high osmolar contrast for further imaging can be carefully avoided. CT neck, chest with abdomen with low osmolar soluble contrast is a better modality which is highly sensitive and can detect both site of perforation and the presence of foreign body.

Also endoscopy if planned should be performed with utmost care since it can flare up mediastinitis or sepsis, and in our experience in such cases endoscopic retrieval of such impacted foreign body like dentures is always a failure and surgery is needed in all such cases. Out of the four cases which has been described three of them got perforation in the upper oesophagus and one in thoracic oesophagus. All patients who got cervical oesophagus perforation with neck exploration got a better post-operative outcome when compared to the patient who got thoracic perforation who needed a thoracotomy and repair. Even though that

patient got a thoracic leak he settled with conservative management and is doing well now.

A number of case reports claim that even impacted foreign body in oesophagus with oesophageal perforation can be managed with endoscopic removal and clip application. But even though foreign body could be retrieved a proper anatomical closure of oesophagus cannot be obtained endoscopically since clip application just approximates the mucosa. Proper anatomical closure will be definitely needed in such cases which can be done only surgically.

### Conclusion

Impacted foreign body in the oesophagus with oesophageal perforation is an indication for surgery and in most of these cases oesophagus after foreign body removal can be managed with primary repair if contamination and length of oesophageal perforation is minimal. Even though a number of case reports claim endoscopic removal with clip application is possible after impacted foreign body in oesophagus with perforation experience in our centre favours surgery as a definite treatment for such cases.

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