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Role of Cervical Oesophagomyotomy for Retrieval of Impacted Foreign Bodies in the Oesophagus

Amarjothi JMV*, Jesudason J, Ramasamy V and Babu OLN

Department of Surgical Gastroenterology, Madras Medical College, Chennai, India

Abstract

Cervical oesophagotomy is the gold standard for impacted foreign bodies in the proximal oesophagus. It can be done with minimum morbidity even in the most severe of foreign body impaction. Endoscopic retrieval though the first procedure of choice is not successful in all cases of impaction. The outcomes of this versatile procedure are described in myriad of foreign bodies in the cervical oesophagus. We wish to examine the role of cervical oesophagomyotomy in the management of such cases in the light of our experience and study literature for the same.

Keywords: Cervical oesophagotomy; Impacted foreign bodies; Oesophagus

Introduction

Though most foreign bodies in the oesophagus pass through, uneventfully, endoscopic or surgical intervention may be necessary in 20% and 1% respectively [1]. A plethora of foreign bodies can get impacted in the oesophagus and the type of object is usually based on age [2]. It is to be noted that coins are associated with children, meat with adults and dentures with the elderly. Though, endoscopy can retrieve these objects, some of these objects by the presence of metal clasps or sharp protuberances or irregular, pointed surfaces make endoscopy difficult.

Literature Review

Ours was a retrospective analysis of all cases of cervical oesophagotomy for foreign body in the cervical oesophagus since 2007. In our experience, 14 patients have presented with endoscopically refractory foreign bodies (9M: 4F) with mean age of 46.7 yrs (Range 24-60). The mean time to presentation of 4 days (Range-1-14) days. The most common impacted foreign body not amenable to endoscopic retrieval was dentures (n=5), followed by bones (n=3) (Table 1). It is to be noted that coins (5), food boluses (3), fruit seed (1), hair pin (1), bell pin (1) were amenable to endoscopic extraction. The morbidity due to leak was 14.2% (n=2) and the mortality rate was nil which is like most studies reported in literature [3].

Discussion

Classification of impacted foreign objects in the cervical oesophagus

The types of materials that can get impacted in the cervical oesophagus can be classified into either food bolus impactions and true foreign bodies. True foreign bodies can be further divided into blunt objects (e.g. buttons, coins), sharp-pointed objects (e.g. bones, toothpicks, nails, dental bridge work), and miscellaneous (e.g. disk batteries, narcotic packets). Determining the classification of the ingested material along with its characteristics is essential to proper diagnosis and management. The management of some commonly impacted foreign bodies are described below.

Food bolus impaction

Proteolytic enzyme, like papain, should not be used [4] since it can be associated with hypernatremia, erosion, and oesophageal perforation. The administration of intravenous glucagon may relax the oesophagus and promote spontaneous passage of an impacted food bolus while endoscopic therapy is planned [5]. Food boluses causing high grade obstruction must be subjected to immediate endoscopic retrieval [6].

Blunt objects

Coins can be removed easily with a foreign body forceps (Rat-tooth, alligator) or a snare. Smooth round objects are best secured with a stone retrieval basket. Objects that cannot be easily grasped in the oesophagus may be advanced into the stomach, where they may be more easily grasped especially those greater than 2.5 centimetres in diameter must be treated by endoscopic retrieval. However, most blunt objects are treated with conservative treatment for spontaneous expulsion [6].

Sharp-pointed objects

The ones most commonly associated with complications are chicken and fish bones, clips, toothpicks, needles, dentures and pins. Sharp-pointed objects lodged in the oesophagus represent a medical emergency. Direct laryngoscopy with Mc Gills forceps is preferred for objects lodged at or above the cricopharyngeus [6]. Rigid or flexible endoscopy may be used for objects below this area. Most sharp-pointed objects that enter the stomach will pass through the remaining GI tract without incident. However, the risk of complications due to a sharp-pointed object is as high as 35% [7]. Therefore, a sharp pointed object that has passed into the stomach or proximal duodenum should be retrieved endoscopically if it can be accomplished safely [4-8]. If the sharp foreign body perforate the cervical oesophagus, surgical oesophagotomy can be done for retrieval.

Disk batteries

They usually are an emergency as they can leach on impaction. Endoscopic techniques like basket retrieval, through-the-scope balloon under direct vision are commonly used. If the battery cannot be directly

***Corresponding author:** Amarjothi JMV, Department of Surgical Gastroenterology, Madras Medical College, Chennai, India, Tel: + 91 9840375953; E-mail: drmosesvikramamarjothi@hotmail.com

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S.no	Type of foreign body	Age/sex	Time to presentation (Days)	Level of impaction in oesophagus	Endoscopy failure	Management	Post op. Complication
1	Partial radiolucent denture	45/f	2	Cervical	Yes	Cervical oesophagotomy and retrieval	Nil
2	Partial radiolucent denture	55/m	3	Cervical	Yes	Cervical oesophagotomy and retrieval	Closure site leak
3	Partial radiolucent denture	57/m	4	Cervical	Yes	Cervical oesophagotomy and retrieval	Nil
4	Partial radiolucent denture	60/f	14	Cervical	Yes	Cervical oesophagotomy and retrieval	Nil. Normal gasrtografin study on POD 7
5	Partial radiolucent denture	57/m	4	Cervical	Yes	Cervical oesophagotomy and retrieval	Nil. Normal gastrografin on POD 7
6	Crab clip	30/m	2	Cervical	Yes	Cervical oesophagotomy and retrieval	Nil. Normal gastrografin on POD 7
7	Sowing needle	47/m	3	Cervical (posterior pharyngeal wall)	Yes	Cervical oesophagotomy and retrieval	Nil. Normal gastrografin on POD 7
8.	Fish bone	44/m	4	Cervical	Yes	Cervical oesophagotomy lateral oesophagotomy	Oesophagotomy closed after-1 yr
9.	Plastic cap	25/m	1	Cervical	Yes	Cervical oesophagotomy and retrieval	Nil. Normal gastrografin on POD 7
10.	Chicken bone	54/m	4	Cervical	Yes	Cervical oesophagotomy and retrieval.SL	Normal gastrografin on POD 7
11.	Pin	24/m	6	Cervical	Yes	Cervical oesophagotomy and retrieval	Nil. Normal gastrografin on POD 7
12	Chicken bone	28/m	4	Cervical	Yes	Cervical oesophagotomy and retrieval	Leak managed conservatively
13	Mango seed	40/f	2	Cervical	Yes	Cervical oesophagotomy and retrieval	Nil. Normal gastrografin on POD 7
14	Razor blade	33/f	1	Cervical	Yes	Cervical oesophagotomy and retrieval	Nil. Normal gastrografin on POD 7

Table 1: List showing the type of foreign body impacted in the cervical oesophagus requiring an oesophagotomy for retrieval of foreign body.

retrieved from the oesophagus successfully, it should be pushed into the stomach where it can often be successfully endoscopically retrieved with a basket. Disc batteries not amenable to endoscopic retrieval or in cases of cervical oesophageal perforation, surgical intervention is contemplated [6].

Presentation after foreign body ingestion

In older children and fully conscious adults, foreign object ingestion may be recognized at the time of the ingestion. Patient localization of the level of impaction, however, is not reliable. Conversely, in many instances the ingestion goes unrecognized or unreported until the onset of symptoms, which may be delayed hours, days, to even years from the time of ingestion. In small children or the mentally impaired, it may be inferred when the patient presents with choking, refusal to eat, vomiting, or blood-stained saliva or respiratory distress.

Diagnosis of impacted cervical oesophageal foreign bodies

Most true foreign objects are radiopaque and can be identified on plain films of the neck or chest. These examinations should be performed in asymptomatic patients with a history of foreign body ingestions, especially in the paediatric age group. However, objects such as fish or chicken bones, vegetative matter like woodchips, seeds, plastics including modern dentures, most glass, and thin metal objects are not readily seen. Hence a negative radiograph does not imply an absence of foreign body. A contrast examination should not be performed in all patients with suspected high grade acute oesophageal obstruction due to risk of aspiration and difficult subsequent endoscopy.

Persistent symptoms related to the oesophagus in cases of suspected foreign body ingestion should be pursued with endoscopy even after an apparently unrevealing radiographic evaluation. However, it is to be noted that even endoscopy may be difficult to localise some of these foreign bodies like dentures. The acrylic dentures are imperceptibly camouflaged with the surrounding mucosa due to its dull colour and oedematous mucosa may obscure its view on endoscopy. Sharp foreign objects may even perforate the surrounding cervical oesophagus and make diagnosis difficult.

Management

The management options for impacted foreign bodies in the cervical oesophagus include either endoscopy or surgery through a cervical oesophagomyotomy.

Endoscopy

In fact, endoscopy is the preferred method for extraction with a reported success rate of 83% [9]. The success rate of endoscopic intervention is influenced by the patient's age, the anatomic location in which the object is lodged and the technical abilities of the endoscopist. The timing of endoscopic intervention in foreign body ingestion is dictated by the perceived risks of aspiration and/or perforation. Those requiring immediate retrieval include those with sharp objects, disk batteries, foreign bodies or food impactions resulting in high-grade obstruction Rigid and flexible esophagoscopy are both safe and effective methods of removing various oesophageal foreign bodies [4,10,11].

Rigid esophagoscopy or direct laryngoscopy may be attempted for sharp objects impacted at the level of the hypopharynx and cricopharyngeus muscle. Flexible endoscopy is preferred in most other circumstances as it is successful in most patients, allows thorough examination of the oesophagus, stomach and duodenum, does not usually require general anaesthesia, and is less expensive [4].

Surgery-cervical oesophagomyotomy

Since Markoe demonstrated the feasibility of using the cervical

approach for oesophagotomy to remove foreign bodies from the oesophagus [12]. Many articles [13-16] have supported this as the gold standard in impacted cervical oesophageal foreign bodies in general and dentures, especially in those with failed endoscopic retrieval. After surgical retrieval, the oesophagotomy can be closed primarily or over a T tube [17]. FB impacted in the oesophagus can cause mucosal inflammation, ulceration and perforations and, consequently, severe infections such as mediastinitis, deep neck abscess aspiration, pleural empyema may occur. Other complications reported are scarring, obstruction and fistulisation [18-20].

In a study of medical literature [3] surgical approach through cervical oesophagotomy in cases of foreign body ingestion was found in 11 publications describing 29 patients. These studies reported an overall complication rate of 17.2% and a mortality rate of 0%. In the 29 cases of cervical or thoracic oesophagotomy for foreign body extraction, most cases were uneventful (82%). The complications included oesophageal suture line dehiscence with possibly pre-existing oesophageal necrosis as a risk factor [21], pharyngeal stricture (one case) [22] oesophageal fistula (one case) [23], and serious wound infections (Two cases) [22,24]. Based on the location of the foreign body in the upper oesophagus, skin incision is made on the left side of the patient's neck along the leading edge of the sternocleidomastoid muscle (Figures 1A-1D). The sternocleidomastoid muscle and omohyoid muscle, as well as the peritracheal muscles, are retracted laterally and medially to expose the carotid sheath. The oesophagus is encircled with an umbilical tape and stay sutures are placed laterally in anticipation of future longitudinal incision of the oesophagus (Figure 2). The hooking of the oesophagus isolates the oesophagus from the recurrent laryngeal nerves in the vicinity and reduces injury to the same. Foreign body is removed in an uneventful procedure without further damage to the oesophagus. In cases where the oesophageal wall is not inflamed, the oesophageal wall is sutured primarily with 2-0 vicryl in an interrupted manner with Ryles tube placed through the mouth traversing the oesophagotomy site. There is an option to make a lateral oesophagotomy if the wall is friable. Ryles tube is usually

Figure 1A: Some of the impacted foreign bodies removed after cervical oesophagotomy in US series: Acrylic partial denture.

Figure 1B: Crab clip.

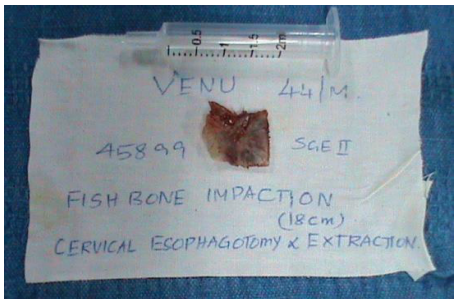

Figure 1C: Fish bone.

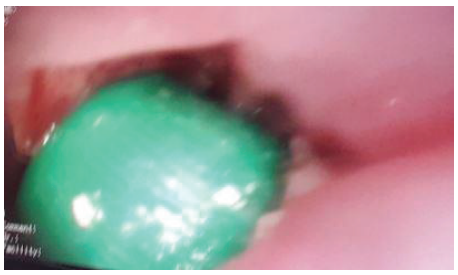

Figure 1D: Plastic bottle cap impacted at the cervical oesophagus.

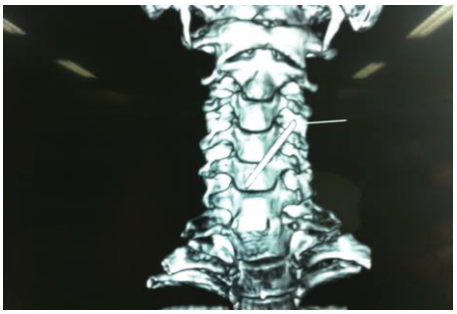

Figure 2: CT showing the sowing needle impacted in the neck.

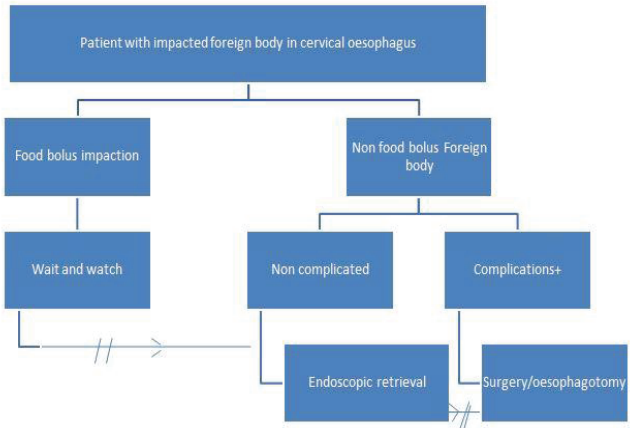

Figure 3: Management protocol for impacted foreign bodies in cervical oesophagus.

insert erred which acts a stent and for feeding purposes. skin closure is subsequently performed, and the wound is closed without a drain. A reasonable treatment plan for impacted foreign bodies at the cervical oesophagus would be as follows in Figure 3.

Conclusion

Cervical oesophagotomy is still the gold standard and last resort for impacted cervical foreign bodies. In the era of endoscopy, there is however a more selective role in endoscopically refractory patients and suspicion of perforation. Cervical oesophagotomy can still be done with very low morbidity and mortality.

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