

# Esophageal Food Impaction: A Homemade Suction Tube Attached to Esophagogastroduodenoscopy for Food Bolus Removal

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The most common esophageal foreign body in adults is impacted food bolus. Polypectomy snares, Dormia baskets, retrieval nets, rat-tooth forceps, alligator forceps or polyp graspers are usually used to remove it. Here, we report the case of a 78-year-old woman whose esophagogastroduodenoscopy (EGD) showed a firm goose liver impacted tightly in the lower esophagus; all of the above-mentioned retrieval instruments could not remove it. We used a homemade device by attaching a modified nasogastric tube to an EGD and successfully removed the goose liver by suction under endoscopic visualization. The method is very effective to remove firm and tightly impacted materials in a narrow lumen. When the usual retrieval instruments fail, a homemade suction tube attached to an EGD is an alternative. [*J Chin Med Assoc* 2008;71(12):635–638]

**Key Words:** esophagogastroduodenoscopy, esophagus, foreign body, nasogastric tube

## Introduction

Ingested gastrointestinal (GI) foreign bodies and food bolus impaction occur often and are the second most common endoscopic emergency after GI bleeding.<sup>1</sup>

Most ingested foreign bodies and food bolus impactions pass through the GI tract spontaneously without clinical complication.<sup>2</sup> However, 10–20% require nonoperative, usually endoscopic intervention and 1% or less may require surgery.<sup>3,4</sup> Esophageal food bolus impaction is the most common “foreign body” in adults. If there is no distal obstruction and no mucosal trauma, we can push the food bolus into the stomach using the tip of an endoscope.<sup>5</sup> Once in the stomach, most foreign bodies pass through the GI tract without complications in 1–2 weeks.<sup>1</sup>

Smooth muscle relaxants such as glucagons, nitroglycerin and nifedipine have been used for removing food impactions via promoting passage of esophageal impaction into the stomach.<sup>1,6,7</sup> However, they do not work when a fixed obstruction is present, which is often found with food impaction.

Radiologic methods including Foley balloon catheters, suction catheters, wire baskets, or magnetic catheter

under fluoroscopic guidance for esophageal foreign body removal have been reported.<sup>8,9</sup> But these methods do not match the efficacy or safety of esophagogastroduodenoscopy (EGD).<sup>10,11</sup> Therefore, when there is evidence of near complete esophageal obstruction with the patient unable to handle their secretion and salivation, urgent endoscopic intervention should be performed.<sup>4</sup>

Food bolus retrieval with polypectomy snares, Dormia baskets, retrieval nets, rat-tooth forceps, alligator forceps and polyp graspers have all been reported.<sup>2,12</sup> In this case, we could not remove a firm and tightly impacted goose liver by using the above instruments. Here, we report successful removal of the impacted goose liver by application of an easily homemade suction device, by attaching a modified nasogastric tube to an EGD. To our knowledge, this homemade device has not been reported before.

## Case Report

A 78-year-old woman suffering from primary biliary cirrhosis had a history of esophageal variceal hemorrhage



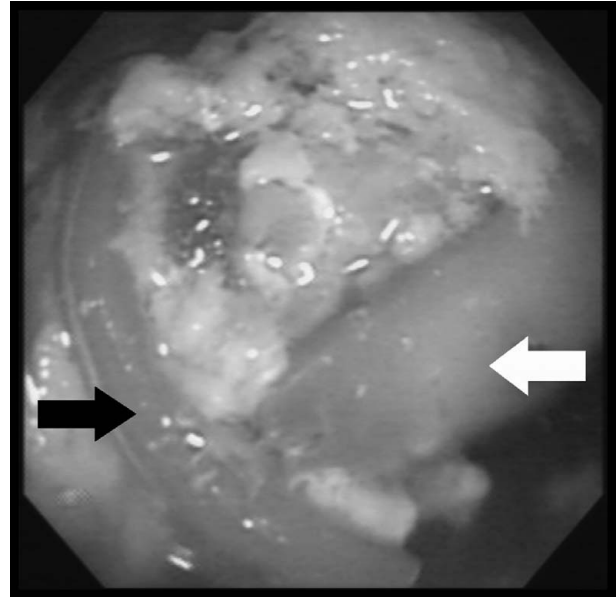
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and had undergone endoscopic variceal ligation (EVL) until eradication. In February 2007, she was admitted to our hospital due to salivation, severe dysphagia and postprandial vomiting for 2 days. EGD showed amorphous food material retention in the dilated esophagus. The retained fluid was removed using the suction function of the endoscope. We used a Dormia basket and alligator forceps to remove the food debris. However, a residual, firm food bolus was impacted tightly at the lower esophagus, which could not be pushed into the stomach (Figure 1) and could not be removed by a Dormia basket and Roth cotton net. Alligator forceps also failed to remove the tightly impacted material because the food bolus easily became fragmented when removal was attempted. We tried to retrieve the impacted food bolus by an adapted cap, which was attached to the tip of the endoscope and was originally used for variceal rubber band ligation. It also failed because the irregular and firm surface of the material meant that it could not be fully attached to the cap. The negative suction pressure was not effective in this condition.

Finally, we used a homemade instrument to remove the tightly impacted material. Figure 2 demonstrates the materials used in making the homemade endoscopic suction device. The distal segment with side holds of an 18-French nasogastric tube was cut off and the blind end made blunt with sandpaper. Then, the nasogastric tube was tightly attached to the endoscope shaft with a bandage. The end of the tube was set about 1 cm distal to the tip of the endoscope. We inserted the homemade instrument via an overtube and sucked out the tightly impacted material using  $-400$  mmHg of suction pressure under endoscopic visualization. The removed material was a goose liver that measured about  $4.5 \times 2.3 \times 1.8$  cm (Figure 3). We removed the goose liver when we removed the overtube because the goose liver was too big to pass the overtube. The patient admitted that she usually swallowed her food without chewing due to teeth loss. After we removed the goose liver, the endoscope was easily passed through the esophagogastric junction and EGD revealed fibrotic scars at the lower esophagus (Figure 4) due to previous EVL.

## Discussion

Foreign body ingestion in adults often occurs accidentally in people with compromised judgment and senses such as in the elderly, demented, or intoxicated. Intentional ingestion of a foreign body is frequent in psychiatric patients or prisoners.<sup>1</sup>

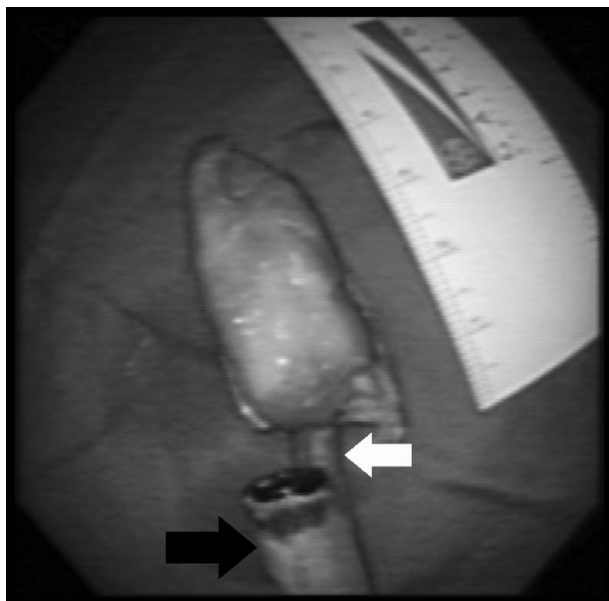


**Figure 1.** A big, firm goose liver (white arrow) with some food debris (black arrow) above it tightly impacted at the lower esophagus.

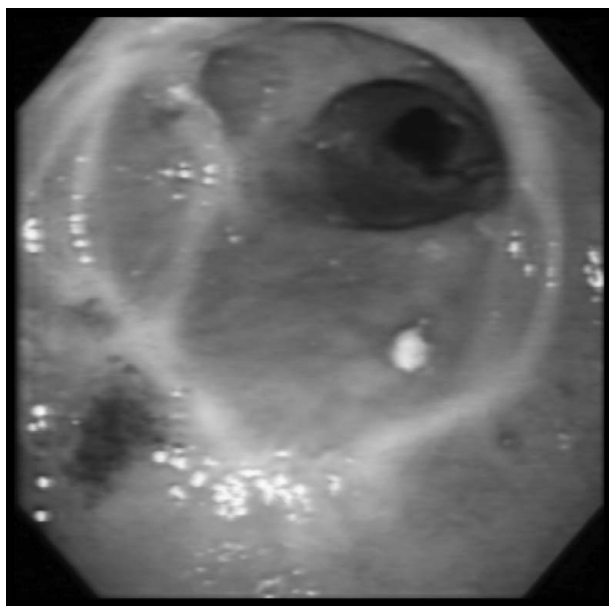


**Figure 2.** On the left side of the figure is an 18-French nasogastric tube. The distal segment with side holds of the nasogastric tube was cut off and the blind end made blunt with sandpaper. In the middle is the distal part of an esophagogastroduodenoscopy. On the right is a roll of 3M tape. We used the 3M tape to tightly attach the modified nasogastric tube to the endoscope shaft. The end of the nasogastric tube was set about 1 cm distal to the tip of the endoscope. Then, the homemade endoscopic suction device was finished.

Esophageal food impaction is the most common type of foreign body ingestion in adults. Patients presenting with food bolus impaction commonly have underlying esophageal disease.<sup>4</sup> The most commonly observed abnormalities associated with food impaction are Schatzki's rings and peptic strictures.<sup>1</sup> Less common



**Figure 3.** The goose liver tightly adhered to the homemade suction tube (white arrow) attached to the endoscope (black arrow). The goose liver measured about  $4.5 \times 2.3 \times 1.8$  cm in size.



**Figure 4.** Esophagogastroduodenoscopy revealed fibrotic scars and a healing ulcer at the lower esophagus.

predisposing causes are webs, extrinsic compression, surgical anastomoses, fundoplication wraps, and bariatric gastroplasties.<sup>5</sup> Esophageal motility disorders such as achalasia, diffuse esophageal spasm, and nutcracker esophagus are infrequent causes of food impactions.<sup>1</sup> In our case, the patient was found to have fibrotic scars at the lower esophagus resulting from previous EVL.

The type of food impaction correlates with the local cuisine and dietary habits of a specific region.

In Western countries, the most common impacted foods are meat products including beef, chicken, pork, and hot dogs.<sup>1,5</sup> In Asia and coastal countries, the most common food foreign body is fish bones.<sup>1</sup> In this case, the old lady presented with esophageal food impaction due to a piece of firm goose liver. Cooked goose liver is a sort of Chinese dish.

Gentle pushing of the food bolus into the stomach using the tip of the endoscope can be easily performed if there is no distal obstruction.<sup>5</sup> The “push technique” has been found to have success rates greater than 95% and complications approaching 0% in the treatment of food impaction.<sup>1</sup> In this case, the lower esophagus was fibrotic and slightly distorted due to previous EVL. Therefore, the big and long piece of goose liver could not be pushed into the stomach.

EGD for treatment of esophageal foreign bodies has a success rate greater than 95% and morbidity and mortality less than 5%.<sup>4</sup> The performance of snares, baskets and nets requires extra space to deploy and catch the food bolus. Forceps or graspers are not powerful or effective enough to remove a large, tightly impacted bolus such as in this case where only fragmented material was grasped. A friction-fit adaptor fitted to the end of the endoscope has been used as a direct-vision suction device to remove impacted food.<sup>13,14</sup> However, the friction-fit adaptor works only when the foreign body can fully seal the adaptor to ensure negative pressure. Some food boluses with firm consistency and irregular shape, like the goose liver in our case, cannot seal the adaptor opening. The characteristics of the goose liver made it difficult to retrieve using the above-mentioned equipment.

We successfully removed the goose liver by application of this easily homemade instrument by attaching a modified nasogastric tube to the endoscope. The homemade instrument has merit because of its smaller caliber tube which makes the suction pressure more effective than a friction-fit adaptor and it does not have the limitations of an irregular touching surface. In summary, this easily made instrument is very effective at removing big, firm, easily fragmented, and tightly impacted materials in the esophagus.

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