Easy and Effective Endoscopic Retrieval of Ingested Sharp Foreign Bodies

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Abstract: Here we reported two cases of successful removal of accidentally ingested sharp foreign body. The swallowed objects were dentures with clasps which increased the risk of gastroesophageal bleeding or perforation in both cases. After several unsuccessful attempts of removal with normal assistant apparatus, the foreign bodies were eventually retrieved by using modified ship-form semitransparent plastic bags without any complications.

Keywords: Foreign body, Dentures, Endoscopy, Removal, Assistant apparatus.

INTRODUCTION

Dentures, also known as false teeth, are prosthetic devices constructed to replace missing teeth , with which better mastication, natural facial appearance, and improvement of pronunciation can be achieved. And accidental dentures ingestion is a common problem in clinical practice. Enclosing risk factors for foreign body of dental origin are the altered consciousness, old persons, and local factors [1], but the most frequent is inadvertent deglutition [2]. Accidental ingestion of dentures with sharp clasps can lead to direct injury, compression ulcer, erosion, abscess formation or perforation if the ingested dentures were impacted in the upper digestive tract, which commonly occurs at the three anatomic constrictions of esophagus. The diagnosis is suspected with chest radiography and confirm by endoscopy. The therapeutic management with extraction of the foreign body is endoscopic and / or surgery. However, a large portion of these cases need surgical interventions. We describe here an endoscopic method for removal of sharp foreign bodies using a modified ship-form semitransparent plastic bag. To our best knowledge, the other intended use of this modified bag has not been previously reported.

CASE REPORT

Case 1

A 69-year-old man who had accidentally swallowed his dentures during meals was immediately referred to us for an attempt at removing the ingested dentures. A computed tomography (CT) scan demonstrated a radiopaque object in esophagus extending from C6 to C7 (Figure **1**). The patient was adequately

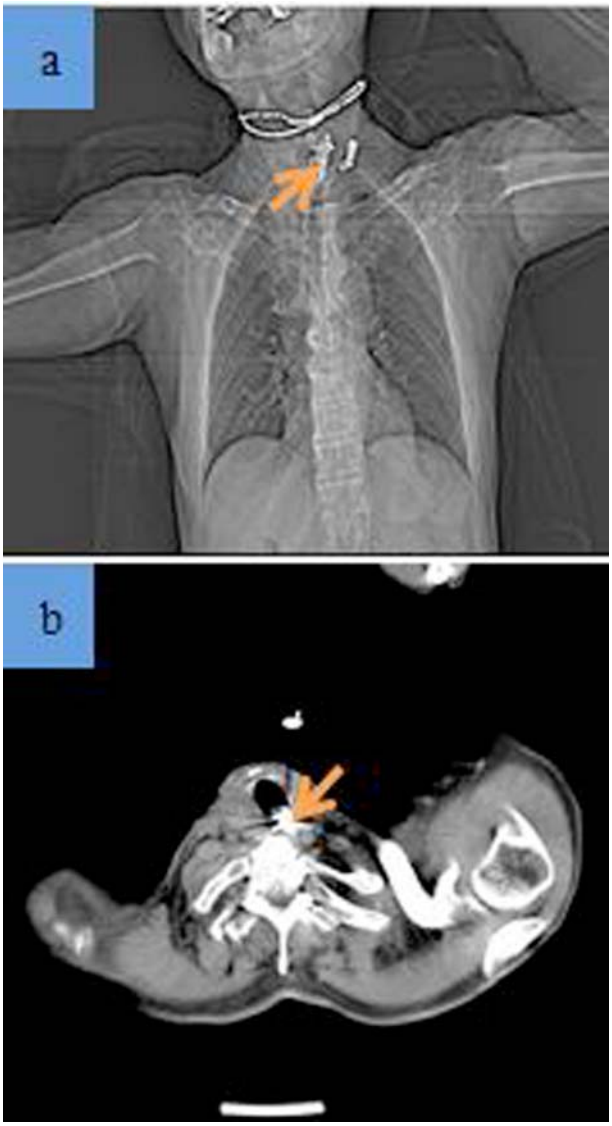

Figure 1: CT scans (**a** and **b**) demonstrated the dentures extending from C6 to C7.

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anesthetized with propofol before an endoscopy. As the endoscope reached the foreign body, dentures with plateau and clasps were revealed. Rat-tooth grasping forceps were used to retrieve the dentures; however, the object was unable to be removed. Given the increasing risk of esophageal perforation due to pressure necrosis as time passed, a decision was made to push the dentures into the gastric cavity with extreme care. However, multiple attempts to retrieve the object by using several types of forceps, net baskets or snares were unsuccessful. And the procedure had to be terminated in that the patient got dyspnea. A later CT scan revealed high density shade in the stomach; left-sided hydropneumothorax; mediastinal emphysema; cervicothoracic subcutaneous emphysema (Figure **2**).

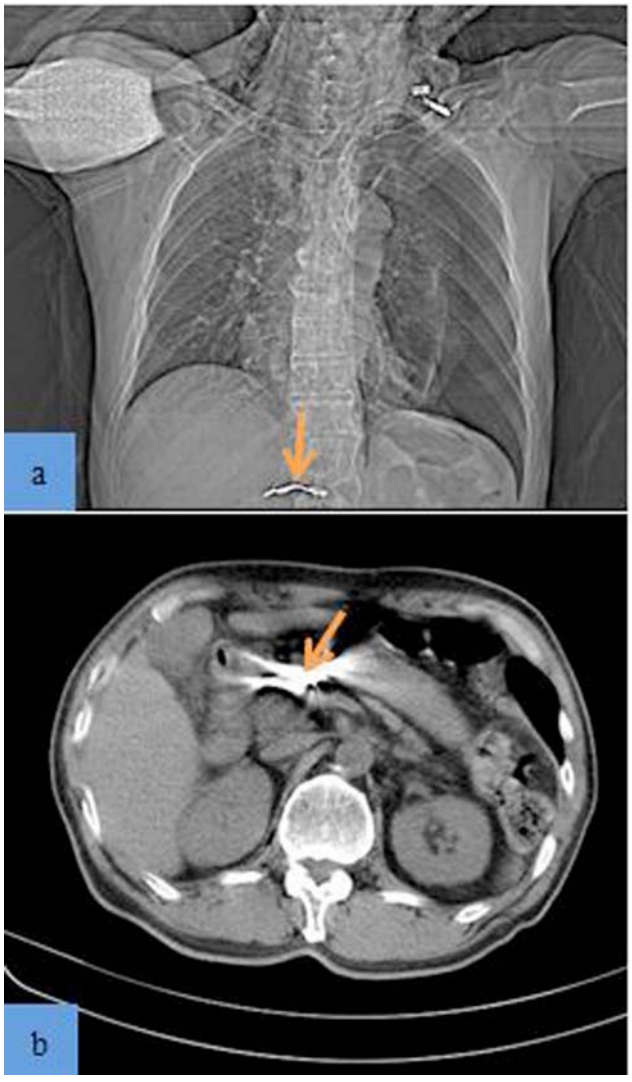

Figure 2: CT scans (**a** and **b**) showed the dentures in the gastric cavity.

Another endoscopy was performed on the patient after uneventful recovery over three days followed closed thoracic drainage. This time, a modified ship-form semitransparent plastic bag was applied. The bag we employed was converted from a laparoscopic retrieval bag which was widely used in laparoscopic operation to help specimen extraction. It was 21*5cm in dimension with an 8cm opening on one side and had a black thread tied to the opening end (Figure **3**). In practical operation, the tip of the endoscope was covered by the bag so that the endoscope together with the bag reached the gastric cavity blindly (Figure **4**). The dentures were found in the pyloric canal and were grasped into the bag with rat-tooth forceps, then the endoscope was removed. Meanwhile, the bag containing the dentures was drawn out through pulling the black thread. Immediately after the removal, the

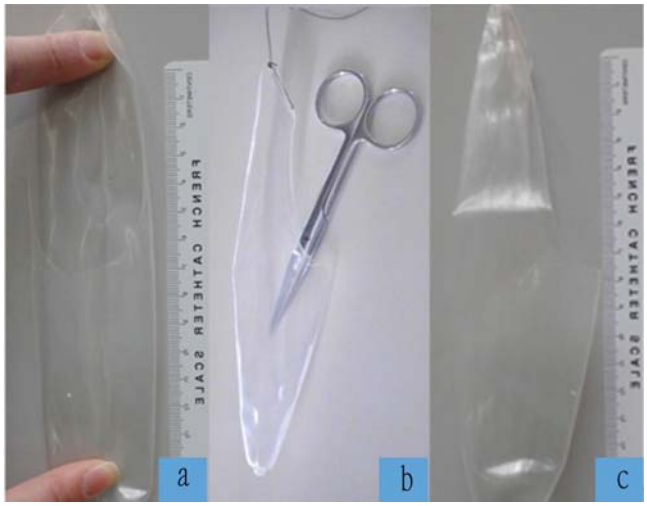

Figure 3: The laparoscopic retrieval bag is ready-made, as is shown in (**a**) and (**c**). And a black thread was tied to the opening end tightly (**b**). It was 21*5cm in dimension with an opening on one side. The size of the opening can be tailored depending on the size of the foreign body.

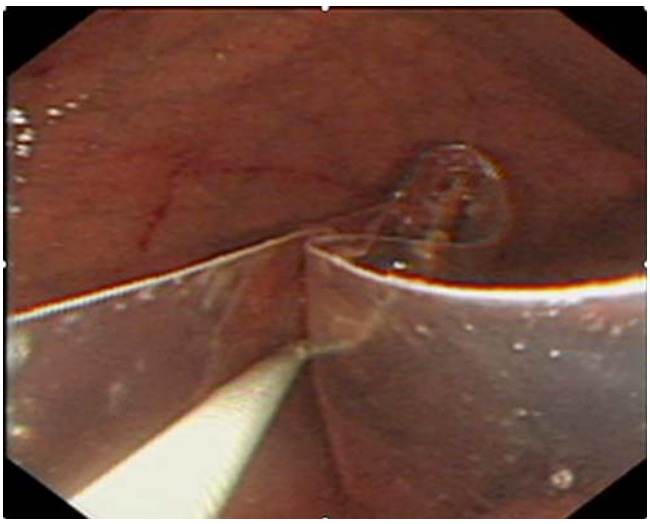

Figure 4: The endoscope together with the bag reached the gastral cavity blindly.

Figure 5: The removed dentures in case 1 (**a**) and case 2 (**b**).

patient had an endoscopy to evaluate the mucosal injury within the esophagus, the gastro-esophageal junction and the stomach. There were different extents of mucosal hyperemia or bleeding, but no ulcer or perforation sign. The patient was further monitored and no complication occurred.

Case 2

The second case, in which the patient was sober and mentally healthy, involved accidental sharp dentures ingestion as well. A 46-year-old man complained no abdominal pain and his abdominal examination was unremarkable. A radiography confirmed the dentures, which passed through the esophagus spontaneously, in the stomach. By using a transparent cap, attempts were made to grasp the object out; however, the clasp of one end was still out of the cover of the transparent cap while the clasp of the other end was in, resulting in a high risk of esophageal injury when the object was pulled up through the esophagus. Eventually, the modified bag was adopted and the foreign body was removed without difficulty as described above. The removed dentures were 4.5cm in length with sharp clasps (Figure **5**).

DISCUSSION

Great progress has been made in therapeutic endoscopy, making it possible to extract most foreign bodies from the upper alimentary tract. A wide range of endoscopic devices, including various kinds of forceps, Dormia baskets, and polypectomy snares, has been used [3]. And transparent cap is increasingly employed in the removal of unusual foreign bodies, such as sharp or pointed objects. The most dangerous foreign bodies for endoscopic extraction are objects with sharp edges [2], due to the difficulty of retrieving the foreign body safely up through the esophagus. When attempts are made to remove such objects inappropriately, life-threatening complications such as hemorrhage, mucosal damage, perforation can occur. There has been reported that unsuccessful endoscopic extraction of dentures induced a large esophageal perforation, leading to an urgent esophagectomy [4]. Before the patient in the second case turned to us, a retrieval of the ingested dentures performed in another hospital ended in failure, following a recommendation of surgery. We also tried to remove the object with the help of the transparent cap, which turns out to be useless in this case. However, the ship-form semitransparent plastic bag is modified by us to serve in these cases to protect mucosa from being injuried by the sharp ends. To date, four successful extraction of unusual foreign bodies using this method have been performed by us and all the foreign bodies were removed without any complications. Our adoption of a modified ship-form semitransparent plastic bag in combination of conventional assistant apparatus provides a safe, convenient and effective endoscopic solution for retrieval of ingested sharp foreign bodies, avoiding open surgery and possible complications.

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There is no conflict of interest.

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