

Esophageal perforation due to inadvertent swallowing of a dental prosthesis

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Intentional or inadvertent swallowing of foreign bodies can lead to severe complications in the gastrointestinal tract, primarily in the esophagus, and requires an urgent approach. In children, coins are the most commonly seen foreign bodies in the esophagus. However, in adults, the solid components of meals, like bones, and in the elderly population dental prostheses are the most frequently observed ingested foreign bodies. Even though a swallowed dental prosthesis is usually seen as a geriatric problem, esophageal obstruction and/or perforation can occur in any denture user in any age group. Thus, the aim of this report was to present one of these interesting cases of esophageal perforation due to a partial denture ingestion and its treatment in a 32-year-old male.

Key words: Esophagus, foreign body, dental prosthesis, endoscopy, perforation, pneumomediastinum, thoracotomy

Yanlışlıkla yutulan dental proteze bağlı özofagus perforasyonu

İstemli olarak ya da yanlışlıkla yutulan yabancı cisimler, başta özofagus olmak üzere tüm gastrointestinal sistemde ciddi komplikasyonlarla seyreden ve acil girişim gerektirebilen sağlık sorunlarına yol açabilirler. Bu durum özellikle çocuklarda ve yaşlı popülasyonda daha da önem arz etmektedir. Çocuklar arasında özofagusta en sık görülen yabancı cisim metal paralardır. Erişkinlerde yemeklerin kemik gibi katı parçaları, yaşlılarda ise diş protezleri ilk sıradadır. Yutulan ve özofagusta takılan diş protezleri sıklıkla yaşlı ve düşkün hastaların problemi gibi gözüke de, bu tür protezleri kullanan tüm yaş gruplarında protezin yanlışlıkla yutulmasına bağlı özofagus obstrüksiyonu ve/veya yaralanması ortaya çıkabilir. Nitekim olgu sunumunda, 32 yaşında erkek hastanın diş protezini yutmasına bağlı gelişen komplikasyonlar ve tedavisi paylaşılmaktadır.

Anahtar kelimeler: Özofagus, yabancı cisim, diş protezi, endoskopi, perforasyon, pnömomediasten, torakotomi

INTRODUCTION

Esophageal foreign bodies, which account for approximately 20% of all gastrointestinal foreign bodies, are encountered more often in childhood, but can also be seen in adults and the elderly. They can lead to serious complications, and often represent a surgical problem requiring urgent intervention (1). In childhood, the foreign bodies found in the esophagus most commonly are coins (2); the swallowing of toy parts and alkaline batteries is also common (1). In adults, the most frequently ob-

served ingested foreign bodies are meat in meals and fish bones (3). In the elderly population, especially in patients with dementia, dental prostheses can create serious problems and appear to be the most commonly ingested foreign bodies in this population (4,5). However, dental prostheses may rarely cause problems for the relatively younger population as well. Therefore, on the first admission to the emergency room, the swallowing of a dental prosthesis should be considered in patients of all

ages who are diagnosed - after a rapid medical history and physical examination - of foreign body in the esophagus, and treatment should be planned accordingly.

CASE REPORT

A 32-year-old male presented to the emergency room with the complaint of inadvertent swallowing of his own dental prosthesis while sleeping. On admission, his blood pressure was 120/75 mmHg and pulse was 76 beats/min. The chest X-ray showed radiopaque hooks of the dental prosthesis at the mid-esophageal level (Figure 1). Esophagogastros-copy was planned, which revealed that one of the prosthesis' hooks was lodged in the esophageal wall (Figure 2).

The foreign body was pushed down into the stomach for manipulation and extraction. During the manipulation, one of the hooks again lodged into the esophageal wall. Immediately after the endoscopy, subcutaneous emphysema and pneumomediastinum occurred. Because of the emergence of respiratory distress and the worsening of the patient's general condition, a thorax drainage with 32 F thoracostomy tube was performed, and the patient was taken to the operating room immediately. The patient was selectively intubated with a double-lumen 7 F Carlens endobronchial tube, the left lung was isolated, and right posterolateral thoracotomy was performed. Then, the right lung was displaced to the middle. Dissection of the distal portion of the esophagus was performed. The hook, which had completely perforated the esophageal wall, was exposed (Figure 3A). The esophagus was retracted. The foreign body was extracted via a small esophagotomy (Figures 3B, C, D). The posterior esophageal wall was checked, and as no other injury was observed, the mucosa and the muscular layer were repaired primarily with 3/0 poly-

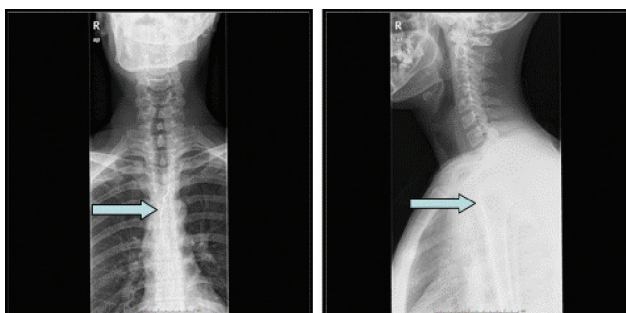


Figure 1. Radiopaque hook of the dental prosthesis at the mid-esophageal level on the chest X-ray.

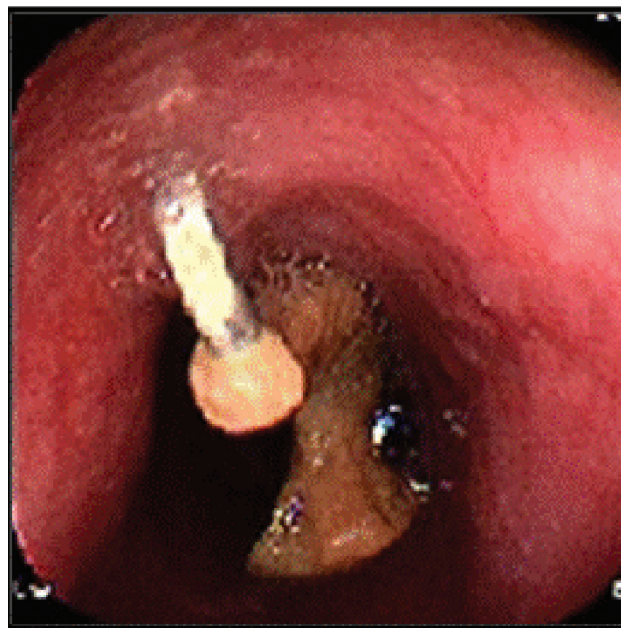


Figure 2. Dental prosthesis seen on esophagogastros-copy – one of the hooks is seen lodged into the esophageal wall.

glactin sutures. A 1.5-cm parietal pleural patch was prepared and applied to the esophageal wall with polyglactin sutures. The azygos vein, which was iatrogenically injured during the preparation of the pleural patch, was ligated. Peroperatively, a second thoracostomy tube (28 F) was placed in the apex of the right lung. The patient was taken to the intensive care unit after the surgery. He was placed on total parenteral nutrition, 500 mg 4x1 metronidazole and 1g 2x1 ceftriaxone sodium. On the 1st postoperative day, he was extubated, and on the 2nd postoperative day, he was transferred from the intensive care unit to the general surgery clinic. The apical thorax tube was withdrawn on the 4th day. Contrast leak with air-fluid level in the posteromedial region of the right hemithorax was shown on the esophageal passage radiography taken on the 7th day (Figure 4). On the 10th day, the patient underwent a second endoscopy with an esophageal fistula diagnosis, and the endoscopy revealed a 1.5-cm fistula orifice on the mid-esophageal wall. The mediastinum was irrigated with 0.9% NaCl solution, and a covered self-expandable metallic stent (SEMS) was applied via endoscopy. On the 1st day after the stent application (11th day after the main operation), the patient was placed on oral fluid nutrient support. The thorax and mediastinum were irrigated daily with sterile isotonic solutions from the thorax tube. The thorax tube drainage sample culture grew methicillin-resistant *Staphylococcus aureus* (MRSA) on the 15th day after the operation. Thus, the antibiotherapy

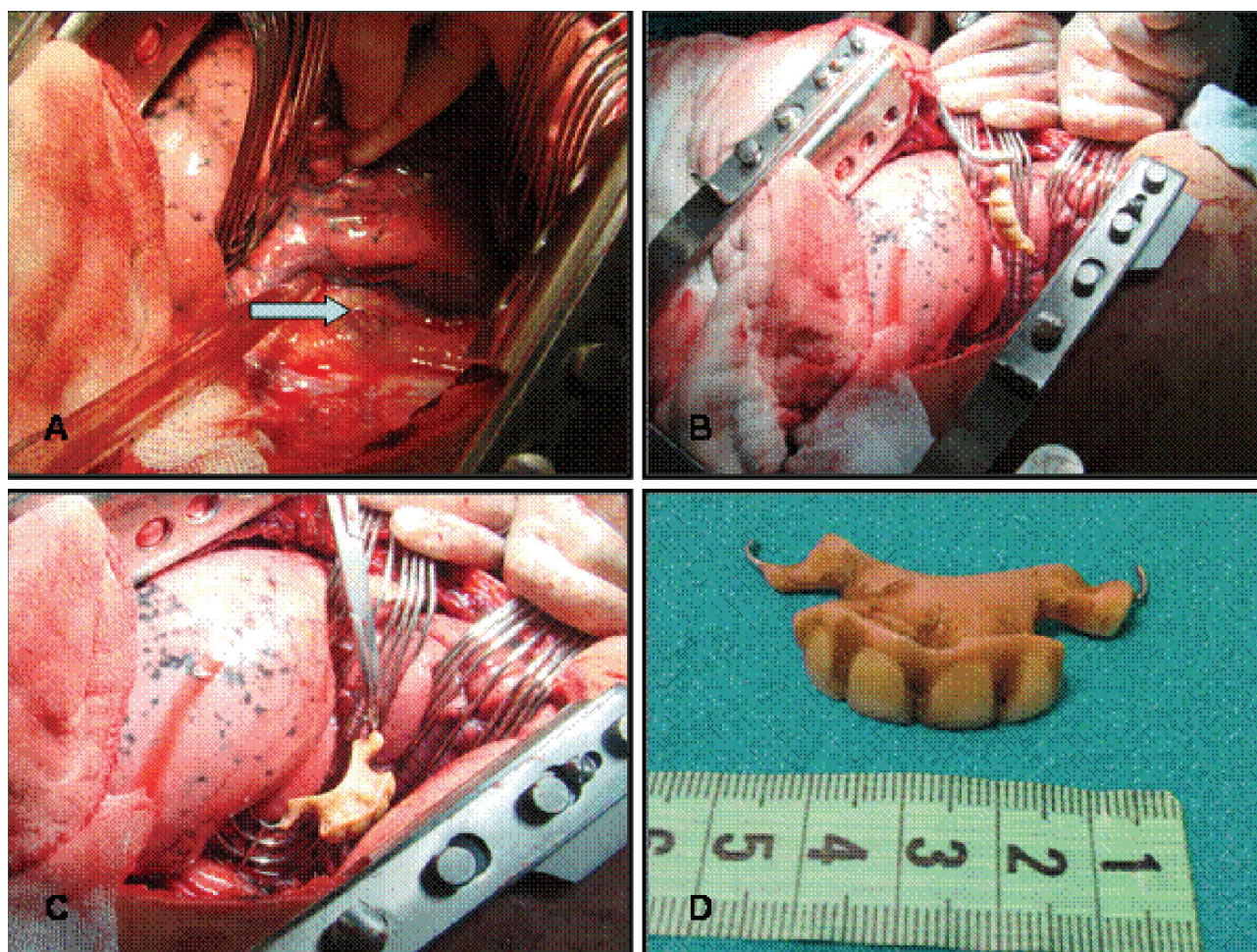


Figure 3. A. Peroperative view of the hook, which has completely perforated the esophageal wall. B and C. Peroperative view of the prosthesis extracted by thoracotomy. D. The swallowed dental prosthesis.

was changed to vancomycin 4x0.5 g. The covered stent was removed by endoscopy on the 30th day (Figure 5). The patient was discharged on the 40th day after the operation after an uneventful postoperative follow-up. He was seen at the 1st month follow-up without any signs of infection or dysphagia problems.

DISCUSSION

Foreign bodies are usually impacted at the first anatomical constriction (70%), which is located at the thoracic entrance at the level of the cricopharyngeal muscle (1,7). The first complaint of 92% of the patients on admission is dysphagia. Neck pain and tenderness, hypersalivation, regurgitation, retrosternal discomfort, and odynophagia are the other complaints (6). Sharp and/or jagged objects may perforate the esophagus. After a detailed anamnesis and careful physical examination,

chest X-ray should be chosen as the first radiological imaging modality. Chest X-ray helps to identify the type of foreign body and to plan the treatment. Eighty percent of foreign bodies can be identified on direct radiography (1). Complications due to the swallowed object - such as pneumomediastinum, pneumothorax, pneumopericardium or abscess formation - can also be diagnosed by radiography. Today, esophagogastroscope offers treatment convenience as well as diagnostic facilities. Endoscopic interventions should be performed primarily for extraction of the foreign objects located in the upper gastrointestinal tract. Many techniques have been described, with rigid endoscopy, fluoroscopic Foley catheter, Magill forceps, and flexible gastroscopy (8). A rapid decision for open surgery is needed in case of failure of the endoscopic attempt or any complication untreatable with endoscopy.

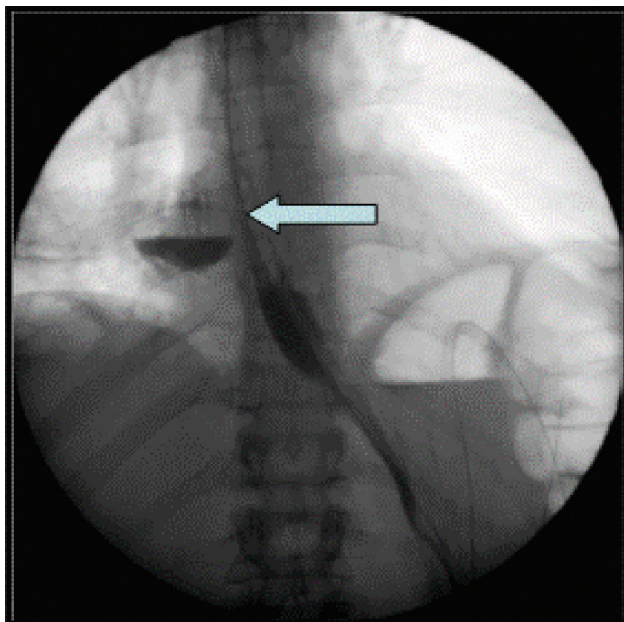


Figure 4. Contrast collection with air-fluid level in the postero-medial region of the right hemithorax shown on the esophageal passage radiography taken on the 7th postoperative day – an esophageal fistula.

In Eren *et al.*'s (12) report of their 98-patient study, the foreign body was dental prosthesis in 3.1% (n: 3) of the cases. This percentage was given as 1.1% (n: 2) by Türkyılmaz *et al.* (1) in their study with 188 cases. The most common cause of esophageal dental prosthesis impaction was their inadvertent swallowing by elderly and dementia patients while eating or sleeping (9). However, in rare cases, swallowed dentures may also cause esophageal obstruction and/or injury in younger populations with such prostheses. In the case of the swallowing of prostheses, there are no differences in the diagnostic and therapeutic approach from that taken for other foreign bodies of the esophagus. The main body of the prosthesis is usually made of acrylic resin, which is radiolucent, but they include radiopaque metallic clips and hooks (10). Thus, many prostheses can be determined on the chest X-ray. As with any other impacted foreign object case, endoscopy provides therapeutic advantages as well as the diagnosis (1,4,11). Yet, the incidence of esophageal perforation can reach up to 20% in view of their large size, rigid and sharp structures and their hooks (6). If a perforation or late complication occurs, a close follow-up is mandatory in addition to perfect open



Figure 5. Covered self-expandable metallic stent (SEMS) placed with endoscopic aid on the postoperative 10th day – after the diagnosis of esophageal fistula - and removed on the 30th day.

surgical treatment, adequate antibiotics and total parenteral nutrition. In the event of a fistulization after the primary repair of the esophageal perforation due to impacted foreign objects, endoscopic covered stent application should be considered to avoid the fatal complications of a second open surgery. A rapid and aggressive approach can certainly reduce the mortality and morbidity. Although there are no wide case series in the literature about covered stent placement to the fistulization after the repair of esophageal perforation due to foreign bodies, successful treatment of esophagome-diastinal, esophagobronchial and esophagovascular fistulas using endoscopic stent technique has been reported (13-16).

Appropriately informing patients with dentures of the possible risks and keeping them under follow-up may prevent such accidents. The data from Turkey is insufficient at present. However, a report from the United States published by Redford *et al.* (17) in 1991 revealed that 1 of 5 persons aged 18-74 years has a partial or total dental prosthesis; thus, the importance of an appropriate approach to these cases during the diagnosis and treatment is obvious.

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