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Vocal cord immobility after lateral pharyngotomy extraction of the impacted dentures in the upper esophagus: A Case Report

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ABSTRACT

Impaction of foreign bodies in the esophagus is a frequent emergency in otorhinolaryngology. However, diagnosing and managing denture impaction in the esophagus presents greater challenges compared to other foreign bodies, often leading to various complications. This study reported a rare case of vocal cord immobility after the evacuation of denture impaction in the esophagus using lateral pharyngotomy. The patient, a 73-year-old man, experienced throat discomfort after swallowing a denture an hour before admission. According to the CT scan carried out, a 3.7 cm long denture was found around the T3-T5 spine level and was located 3 mm lateral right to the descendant aorta and 4 mm posterior of the trachea. During esophagoscopy extraction, the denture was stuck in the upper esophagus and was successfully evacuated by lateral pharyngotomy. Subsequently, the patient developed vocal cord immobility, and this case underscores the importance of considering vocal cord complications following the extraction of a denture impaction in the esophagus.

Keyword: Esophageal Foreign Body, Pharyngotomy, Vocal Cord

ABSTRAK

Benda asing pada esofagus adalah salah satu kegawatdaruratan yang sering terjadi di bidang telinga, hidung, dan tenggorok (THT). Diagnosis dan penanganan gigi tiruan di esofagus jauh lebih rumit dibandingkan benda asing lainnya dan dapat menyebabkan beberapa komplikasi. Dalam laporan kasus ini, kami menjelaskan kasus yang jarang terjadi, yaitu imobilitas pita suara setelah mengevakuasi gigi tiruan di esofagus menggunakan faringotomi lateral. Seorang pria berusia 73 tahun datang dengan keluhan rasa tidak nyaman di tenggorokan setelah tertelan gigi tiruan satu jam sebelum masuk rumah sakit. Dari hasil CT scan ditemukan gigi tiruan sepanjang 3,7 cm di sekitar tulang belakang T3-T5 dan terletak 3 mm di lateral kanan aorta descenden dan 4 mm di posterior trakea. Selama ekstraksi esofagoskopi, gigi tiruan tertancap di esofagus atas. Gigi tiruan kemudian berhasil dievakuasi melalui faringotomi lateral. Imobilitas pita suara diamati setelah pencabutan gigi tiruan. Imobilitas pita suara harus dipertimbangkan setelah mengevakuasi gigi tiruan yang terkena dampak di esofagus.

Keyword: Benda Asing pada Esofagus, Faringotomi, Pita Suara

1. Introduction

Foreign body impaction in the esophagus is one of the ear, nose, and throat (ENT) emergencies that can lead to serious complications. [1] It commonly occurs in children ages six months to 6 years, but adults are also at risk [2] About 80%-90% of the swallowed foreign body may pass the esophagus without causing impaction, and 10%-20% that cause impaction need esophagoscopy extraction. Only 1% of the cases require surgical intervention. Plastic Products, food bolus, metal products, fish bones, other animal bones, jujube shells, and dentures are the types of foreign bodies that could get impacted in the esophagus in adults. Among them, denture impaction in the esophagus is more difficult for the otolaryngologist [1] Diagnosis of impacted dentures is difficult because it may be radiolucent. [3] Late impacted denture removal in the esophagus may increase the risk of pulmonary aspiration, mediastinitis, sepsis, esophageal obstruction, esophageal perforation, and pressure necrosis.[4] Impacted dentures in the esophagus rarely lead to vocal cord paralysis.[5] Vocal cord paralysis may lead to vocal fatigue, shortness of breath, and even aspiration leading to aspiration pneumonia. [6]

The evacuation of impacted dentures in the esophagus is challenging. Although not related to the esophagus, several structures are very close to each other. The trachea lies in front of the esophagus, while the spine, thoracic duct, pericardium, azygos vein, and aorta are positioned behind it. Pleura flank the esophagus on both sides.[7] The evacuation strategies for removing foreign bodies in the esophagus include endoscopic and surgery.[8] The endoscopic procedure is the treatment of choice because it is more comfortable, less traumatic for the patients, and usually successful.[9] However, surgery such as lateral pharyngotomy is necessary if the foreign bodies are sharp or large or the endoscopic method is ineffective. [9,10] A dental prosthesis metal clasp, large size, and sharp edges can easily penetrate the esophageal wall, making endoscopic removal unsafe.[1] This case report aims to show a case of vocal cord immobility after the extraction of impacted dentures in the esophagus using lateral pharyngotomy.

2. Case Report

A 73-year-old male incidentally swallowed his denture while drinking one hour before admission. The dentures were made from acrylic and contained wire as their hook with 3x4x2cm dimension. The patient felt discomfort in the throat that radiates to the chest. There was no difficulty or pain in swallowing, gagging, or drooling. Hoarseness, shortness of breath, as well as coughing, were not present. The patient has tried to expel the dentures by vomiting but failed.

On physical examination, the patient had stable vital signs with minimal pain which increases during swallowing. There was no stridor, dyspnea, or retraction on breathing. Symmetrical chest movement with vesicular breathing on both chests was found. The patient pointed at his throat and chest as the most discomfort areas. However, his neck had no subcutaneous emphysema, crepitation, or tenderness. Missing parts of three molars on the left upper alveolar segment were seen without lacerations on the oral cavity (Figure 1). Endoscopy evaluation found no foreign body, inflammation, obstruction, penetration, or aspiration along the hypopharynx.

Figure 1. Missing part of the molars

Conventional radiography for the neck and thorax revealed a foreign body around T4-T5 spine level, posterior to the trachea. A contrast CT scan was done for better visualization with the result; a 3.7 cm long foreign body around the T3-T5 spine level was located 3 mm lateral right to the descendant aorta and 4 mm posterior of the trachea (Figure 2). The hook of the dentures impacted the posterior wall of the esophagus.

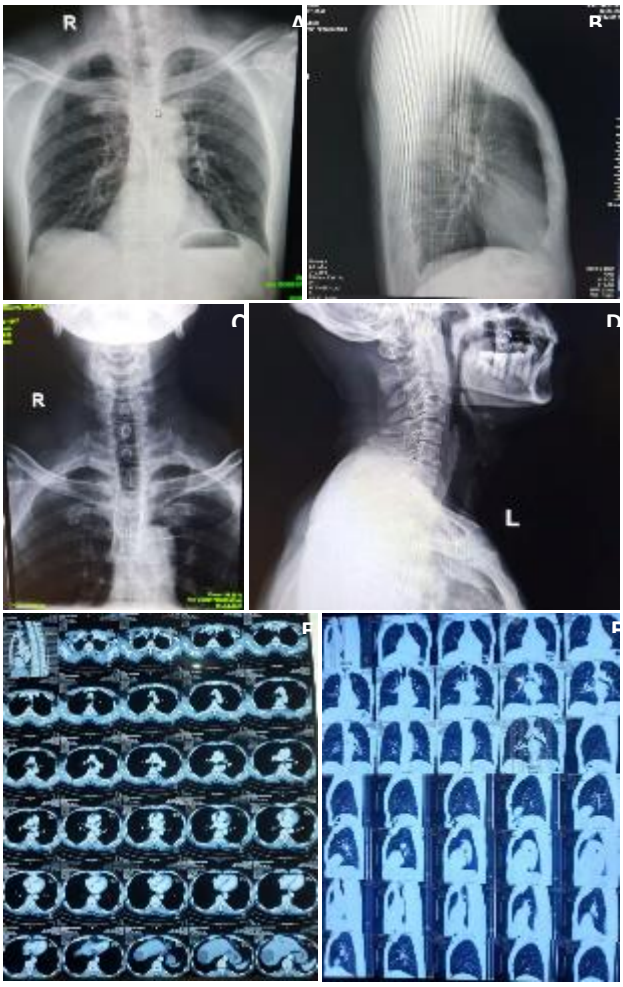

Figure 2. (A, B) conventional radiography of the thorax, (C, D) conventional radiography of neck soft tissue, (E, F) contrast CT scan of the thorax.

The patient was prepared for an endoscopic extraction procedure under general anesthesia at Cipto Mangunkusumo National Hospital. Pharyngotomy, thoracotomy, and esophagotomy were planned as backup procedures. In preparation, the patient fasted and received 2000 mg of cefazolin in 24 hours as prophylaxis. A general examination for anesthesia procedure revealed that the patient had uncontrolled type two diabetes mellitus.

Endoscopic extraction was done with no. 8 rigid esophagoscopy. Upon insertion, a denture was seen at 23 cm depth from the incisivus. Several maneuvers with rotator forceps were done to attract the dentures. The foreign body could be attracted up to 15 cm depth from the incisivus, just around the proximal esophageal opening, and stuck to the posterior wall of the esophagus. Endoscopic extraction was no longer able to be performed; thus, surgical intervention was indicated. A lateral pharyngotomy procedure was planned as the dentures were located on the upper esophageal sphincter. It is done by an eight cm-long incision of the cutis and subcutis layer around the hyoid bone. Blunt dissection on the strap muscle was done until the pharynx was exposed. The denture was seen with its wire stuck to the pharynx's mucosa. The foreign body was removed carefully, and the surrounding structure was explored to ensure no perforation. The incision was then closed layer by layer to finish the procedure (Figure 3). There were no complications during the procedure.

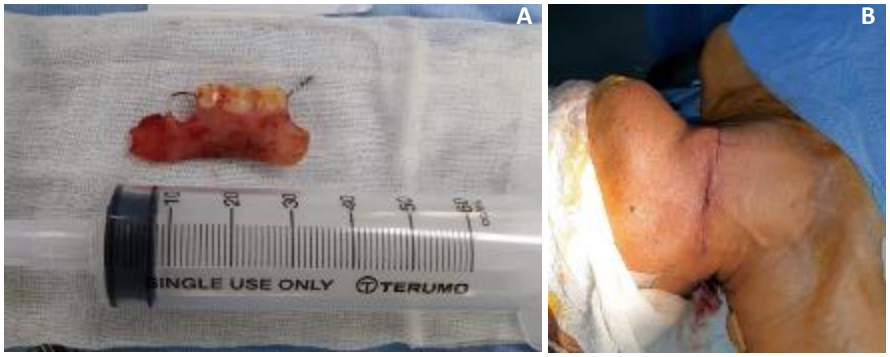

Figure 3. (A) dentures, (B) postoperative procedure.

After the procedure, the patient was observed in the intensive care unit (ICU) for 24 hours. The patient was not allowed to swallow, and a nasogastric tube was inserted. The patient received intravenous doses of ceftriaxone, methylprednisolone, omeprazole, and ketorolac.

After discharge from the ICU, the patient complained of hoarseness. Shortness of breath was not present. On flexible endoscopic examination, the right vocal cord was immobilized in a paramedian position. The patient was allowed to be discharged and planned for further examination in outpatient clinics. The patients also underwent physiotherapy to treat unilateral vocal cord immobility. After two months of follow-up, the patient still complained of hoarseness, and the flexible endoscopic examination still showed immobilization of the right vocal cord. The patient could not complete the physiotherapy due to moving out of town. However, the patient was still being followed up by phone. After six months, the patient no longer complained of hoarseness but was unable to sing in a high pitch.

3. Discussion

[2] The common symptoms of impacted dentures in the esophagus are dysphagia, odynophagia, pain, and tenderness in the chest or neck. Other symptoms include regurgitation, retrosternal fullness, hypersalivation, stridor, and dyspnoea due to tracheal compression.[11] A plain neck and chest X-ray is the initial investigation of choice. However, dentures are usually made of a radiolucent material, which is difficult to assess in a plain X-ray. [3] Barium swallow could determine the location of esophageal denture impaction. However, in contrast studies, it may be mistaken for tumors.[4] CT scan is a gold standard for evaluating the foreign body and its complications that helps the surgeon in preoperative planning. It has 100% sensitivity, 92.6% specificity, 97.9% positive predictive value, and 100% negative predictive value in diagnosing foreign bodies in the esophagus. [8]

The initial emergency management for dentures impacted in the esophagus is airway assessment. Esophagoscopy and denture removal can be planned after securing the airway.[3] Dentures are categorized as sharp objects. Hard, sharp, and pointed objects must be treated immediately with a heightened sense of urgency, preferably within 2 hours. Removal of sharp or pointed foreign bodies for more than 12 hours increased the risk of complications. Flexible esophagoscopy is considered the first-line treatment for foreign body removal. Rigid esophagoscopy could also be an option, especially in impacted foreign bodies in the upper esophageal sphincter and the need for airway protection. However, it required general anesthesia. [2] Gentle manipulation and careful assessment can retrieve the denture. The large dentures need to be cut and removed in pieces to prevent injury. [3] The open pharyngo-esophagostomy approach is necessary in the case of a failed endoscopic attempt or cases with complications such as mediastinitis, parapharyngeal abscess, retropharyngeal abscess, empyema, or aorta-esophageal fistula. [2,3] Intravenous antibiotics and nasogastric feeding are needed during the postoperative period. [3]

In our presented case, the patient incidentally swallowed his dentures while drinking. During swallowing, the upper esophageal sphincter will open, thus allowing the dentures to go down and get trapped in the mid-esophagus. The patient complained of discomfort in the neck that radiates to his chest as the impaction site. The patient had uncontrolled diabetes mellitus, which was predicted to have low immunity. From conventional radiography and CT scan, the foreign body was seen in the mid-esophagus with the hook stuck on the posterior wall of the esophagus. No sign of complication was found in the patient. However, the case was categorized as an emergency and should be managed within 12 hours. During esophagoscopy

extraction, the dentures were stuck on the upper esophageal mucosa. Repeated extraction trials may increase the risk of perforation. Surgical intervention was indicated in this situation.

Complications for delayed removal of impacted dentures in the esophagus include pressure necrosis, pulmonary aspiration, mediastinitis, sepsis, esophageal perforation, and obstruction.[4,12] Vocal cord immobility is a rare complication of impacted foreign bodies in the esophagus.[5] It can occur due to mechanical articular fixation, indirect neuropathy secondary to inflammation, and direct neuropathy.[13] In our patients, vocal cord immobility may also be caused by intubation during general anesthesia. Vocal cord immobility is a rare complication of intubation, with an incidence of less than 0.1%. [14] The vocal cord may be mechanically damaged when compressed by laminas of the thyroid cartilage and endotracheal tube (ETT).[14] The posterior surface of ETT may also push the vocal cord to the oblique neck position and compress the recurrent laryngeal nerve which leads to neuropraxia. [15] In addition, vocal cord immobility in our patients may also be caused by lateral pharyngotomy procedures. Iatrogenic surgery is the most common cause of unilateral and bilateral vocal cord paralysis (46% and 56%).[16] Surgery involving the neck and chest may risk the recurrent laryngeal nerve. The neural injury mechanism due to surgery includes compression, transection, stretching, thermal damage, and vascular compromise. [17]

Vocal cords play an important role in producing voice and protecting the lower airway through glottic competence. The failure of vocal cords to protect the airway during swallowing can lead to aspiration pneumonia. [18,19]Conservative treatment using voice therapy may improve unilateral vocal cord immobility.[20] Surgical treatment such as injection laryngoplasty, arytenoid adduction, medialization thyroplasty, and reinnervation of the recurrent laryngeal nerve can be used for patients not responding to conservative treatment. [21]

4. Conclusion

Lateral pharyngotomy can be used as an option for evacuation of esophageal impacted dentures in the case of failed endoscopic attempts. Denture impaction in the esophagus should be treated immediately because delayed removal would lead to several complications. Although rare, vocal cord immobility should be considered after evacuating impacted dentures in the esophagus so that patients can be informed before surgery as part of informed consent.

5. Acknowledgement

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6. Conflict of Interest

The authors declared no conflict of interest.

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