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Case Report

An Oral Hygiene Care in Cognitive Impairment Patients by Gauze: Is It Really Safe Care Method?

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SUMMARY

Oral hygiene care (OHC) is associated with in-hospital infection. Among the many materials used for OHC, gauze is one of the most common. However, many patients receiving OHC are in a poor state of consciousness and thus at high risk of foreign-body aspiration or ingestion. Here we present three cases of unusual foreign-body obstruction that developed in cognitively impaired patients. These cases highlight the need for increased clinical awareness regarding vulnerable patients at risk of complications related to a foreign body in the gastrointestinal tract or the airway.

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1. Introduction

Patients with severe illness or mental disorders who are unable to independently perform daily activities need multidisciplinary support. An important issue in critical care is personal hygiene.^{1,2} Oral hygiene care (OHC) is known to be associated with in-hospital infection and is performed in a variety of ways.³ OHC, whether in the intensive care unit (ICU) or in a long-term care hospital, is provided by caregivers or the medical staff in a variety of ways, which include the use of gauze.⁴ However, most patients receiving OHC are in a poor state of consciousness and therefore at high risk of foreign-body aspiration or ingestion.

Here we present three cases of unusual foreign-body obstruction that developed in cognitively impaired patients. These cases highlight the need for increased clinical awareness regarding vulnerable patients at risk of complications related to a foreign body in the gastrointestinal tract or the airway.

2. Case report

2.1. Case 1

A 75-year-old woman diagnosed with cerebral infarction and Alzheimer's disease and in a bedridden state was referred to the emergency department (ED) from a long-term care hospital, where she was being treated for pneumonia. Fifteen minutes before ED admission, she was found in state of cardiac arrest by a long-term care hospital nurse. The initial EKG in the ED showed asystole. Cardiopulmonary resuscitation (CPR) was performed immediately.

The first attempt at endotracheal intubation failed because the vocal cord could not be detected, even though the airway was not

deemed difficult. Dark unspecified material was seen in the airway. After its removal using long forceps, intubation was successfully completed. The removed foreign body was a 4 × 4-in piece of gauze. According to the long-term care hospital staff, OHC was performed using a gauze, soaked gauze placed in the mouth of the patient to prevent dry mouth. Despite 30 min of CPR, return of spontaneous circulation (ROSC) was not achieved. An autopsy performed to determine the exact cause of death did not identify any cause other than airway obstruction.

2.2. Case 2

A 68-year-old man was referred to the ED due to swallowing difficulty and vomiting. He was hospitalized in a long-term care hospital, where he was undergoing rehabilitation for quadriplegia caused by a traumatic subdural hemorrhage. On arrival in the ED, his vital signs were as follows: blood pressure 97/71 mmHg, pulse rate 74 beats/min, respiratory rate 18 breaths/min, body temperature 36.7 °C, and oxygen saturation 97%.

The patient's symptoms were nonspecific. And to his caregiver, he had complained of nausea after OHC and subsequently developed persistent vomiting and dysphagia. Based on the caregiver's statement, we suspected a foreign body and thus performed the necessary tests. There was no visible foreign body in the oral cavity, and his lung sounds were clear. He also showed no symptoms of dyspnea. Simple radiography of the neck, chest, and abdomen also did not reveal a foreign body. However, on chest computed tomography (CT), a foreign body was seen in the upper esophagus (Fig. 1A). Endoscopic removal of the foreign body (Fig. 1B) was successful, the foreign body was a 4 × 4-in piece of gauze. The patient was discharged without complications 5 hours later.

2.3. Case 3

A 79-year-old man with decreased mental status was seen at

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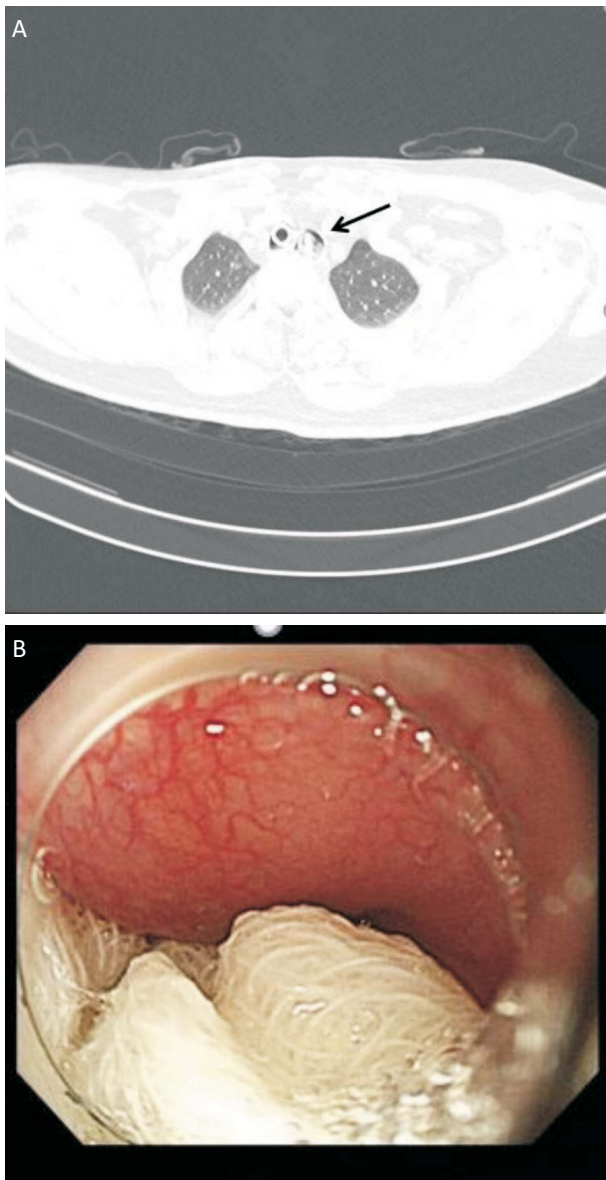


Fig. 1. (A) Chest computed tomography: a foreign body in the upper esophagus (arrow). (B) Endoscopy: a foreign body (gauze) in esophagus.

our ED. His medical history included surgery for laryngeal cancer 20 years ago and an electrophysiological study for arrhythmia. He had been bedridden for the last 2 years with a percutaneous endoscopic gastrostomy. The patient had vomited frequently during the last 3–4 days and severely 1 h before admission. He had also received OHC from the caregiver. His usual mental status was verbal responsiveness. At the time of admission, however, his mental state was stupor. His vital signs in the ED were as follows: blood pressure 120/78 mmHg, pulse rate 77 beats/min, respiratory rate 18 breaths/min, body temperature 38.4 °C, and oxygen saturation 99%. On physical examination, the pupil light reflex was prompt, but the gag reflex was significantly impaired. There were coarse breathing sounds in both lung fields. The initial arterial blood gas analysis (ABGA) was pH 7.452, PCO₂ 44.9 mmHg, PO₂ 66 mmHg, HCO₃⁻ 27.6 mmol/L, SaO₂ 92%. Laboratory findings showed leukocytosis (white blood cells, 14,900/mm³), hyponatremia (125 mEq/L), elevated liver enzymes (AST and ALT 183 IU/L and 174 IU/L), and elevated C-reactive protein (7.48 mg/dL). A chest radiograph showed pneumonia in both lungs, and chest CT revealed pneumonia and bron-

chiolitis with bilateral pleural effusions. Four hours into his ED visit, his vital signs were the following: blood pressure, 80/35 mmHg; pulse, 122 beats/min; respirations, 22 breaths/min; body temperature 37.8 °C and SpO₂, 94%; his EtCO₂ level had increased to 80. His follow-up ABGA was as follows: pH 7.049, PCO₂ 91 mmHg, PO₂ 89 mmHg, HCO₃⁻ 25.6 mmol/L, and SaO₂ 91%. The decision was made to perform endotracheal intubation and to apply mechanical ventilation. Two pieces of gauze packed in the pharynx were detected and removed. At the same time, respiratory arrest occurred, and CPR was performed for 2 min. ROSC was achieved, and the patient was admitted to the ICU, where he was treated for aspiration pneumonia. He was discharged after 10 days of hospitalization.

3. Discussion

Critically ill patients in the ICU and chronically ill patients in long-term care hospitals require special care, including with respect to oral hygiene.^{1,2} The goal of OHC is to reduce the incidence of complications by controlling potential sources of infection.^{3,5,6} Biofilm formation in the oral cavity can be controlled by mechanical methods, such as spatulas, gauze, and toothbrushes, as well as chemical methods, most commonly, 0.12% chlorhexidine.⁴ However, as reported in many studies, dental or other procedures performed in the oral cavity, including OHC, increase the risk of ingestion or aspiration.⁷ To reduce the risk of aspiration caused by OHC, methods such as waterless oral care have been proposed.⁸

If properly managed, a foreign body in the aerodigestive tract causes little morbidity. Most often, the foreign body passes through the gastrointestinal tract without adverse effect. Only 10~20% of patients need endoscopic retrieval; surgical intervention is rare.⁹ However, airway obstruction by a foreign body can be a life-threatening condition, regardless of the age of the affected individual.¹⁰ A study in Japan showed that foreign-body airway obstruction increases with increasing age in elderly people and that obstruction is the leading cause of accidental death.¹¹

Elderly patients with serious dementia or patients with a low level of consciousness have a diminished gag reflex. They also have difficulties in expressing physical discomfort, such as that due to foreign bodies in their aerodigestive tract. Moreover, because the symptoms caused by foreign bodies in the airway or gastrointestinal tract are vague and atypical, diagnosis is almost always delayed. Thus, as demonstrated in the cases described herein, foreign-body ingestion may lead to asphyxia and other potentially fatal complications.¹²

All of our patients had a low level of consciousness, with cognitive, functional, and sensory impairment that led to the presence of unusual foreign-body retention in the airway or esophagus. Similar cases can be expected as the number of elderly, and thus the number of nursing facilities for this population, increases in many societies. A previous study showed that many of the deaths from external causes that occur in nursing facilities are potentially preventable.¹³ However, this requires greater attentiveness by the medical staff and caregivers and better management strategies for patients in the respective facilities. In these cases, there were no evidences of deliberate abuse or indifference, but we think there might be negligence by ignorance. It is necessary to inform the risk of OHC using gauze and to call attention. In hospitals and nursing homes, the danger posed by OHC involving the placement of gauze in the oral cavity must be recognized. We suggest that education should be strengthened for those who perform the OHC.

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