GOIANA JOURNAL OF MEDICINE

DOI 10.63162/V67N69E25631
ISSN 0034-9585
e25631
SCIENTIFIC ARTICLE - CASE REPORT

ACCIDENTAL ASPIRATION OF A FOREIGN BODY INTO THE AIRWAY DURING ANESTHETIC MANAGEMENT: A CASE REPORT

ESTEVAM BORGES LOPES[1], MATHEUS SILVA DE OLIVEIRA[1], GABRIEL PEIXOTO NASCIMENTO[1], HUGO SERGIO DE OLIVEIRA GOMES[1], GUSTAVO SIQUEIRA ELMIRO[1], GULLIANO GARDENGHI[1,2]

1. Centro de Ensino e Treinamento da Clínica de Anestesia (CET - CLIANEST), Goiânia/GO, Brazil.
2. Hospital ENCORE, Aparecida de Goiânia/GO, Brazil.

ABSTRACT

Introduction: Accidental aspiration of a foreign body into the airway during anesthetic management is a rare but potentially serious complication. This event can occur during airway manipulation, especially when using devices for topical anesthesia, intubation, or ventilation, resulting in airway obstruction and significant risk to the patient. Immediate identification and appropriate management are essential to avoid complications. **Case report:** A 38-year-old female patient, ASA II, underwent bodytite liposuction and miniabdominoplasty. During periglottic anesthesia with lidocaine using an atomizer (Mucosal Atomization Device), the tip of the device came loose and was aspirated into the trachea. An initial attempt to remove it with an orotracheal tube was unsuccessful. Flexible bronchoscopy was performed, which allowed the location and safe removal of the foreign body on the first attempt. After the procedure, the patient was reintubated, the surgical procedure was uneventful, and the patient had an uneventful postoperative period. **Discussion:** Iatrogenic foreign body aspiration during anesthetic management is a high-risk situation. This case reinforces the importance of rigorous inspection of devices before use, in addition to the need to prepare the team for emergency airway situations. The prompt use of bronchoscopy was essential for the effective resolution of the event, preventing major complications. Safety protocols and review of medical devices are fundamental strategies for prevention.

Keywords: Foreign body aspiration, Anesthesia, Airway management, Intraoperative complications, Bronchoscopy.

INTRODUCTION

Loose materials that enter the airways during intubation, ventilation, or advanced airway management - a phenomenon known as foreign body aspiration - may result in partial or complete airway obstruction. Early identification and management of these situations reduce patient morbidity and mortality; however, promptly recognizing accidental aspiration of a foreign body can be challenging, as the patient may be sedated and/or anesthetized, and may therefore be misdiagnosed postoperatively with asthma, chronic obstructive pulmonary disease, or stridor.[1]

Iatrogenic foreign bodies in the aerodigestive tract are rare events, as evidenced by the limited

number of cases reported in the literature.[2] Accidental and iatrogenic aspiration during procedures is most commonly encountered during dental interventions.[3] Other authors describe aspiration of components from commonly used respiratory equipment, including materials routinely handled by anesthesiologists. These iatrogenic incidents may be related to equipment malfunction or accidental events during medical treatment and airway management.[3] A foreign body lodged in the esophagus typically presents with dysphagia, whereas aspiration into the respiratory tract may lead to coughing, dyspnea, and stridor, and can progress to complications such as infection and pulmonary atelectasis.[4,5]

Appropriate management for removal of a foreign body from the airway may involve rigid or flexible bronchoscopy under general or local anesthesia, depending on the material and location of the obstruction.[5]

This case report aims to describe the management of foreign body removal from the airway during an anesthetic procedure, highlighting the need for preventive strategies, precautions, and essential safety measures to avoid such incidents and ensure safe anesthetic care.

CASE REPORT

A 38-year-old female patient, 72 kg, 1.62 m, was admitted for bodytite liposuction and mini-abdominoplasty. The pre-anesthetic evaluation classified her as ASA II, with a history of fibromyalgia treated with pregabalin (75 mg) and zolpidem (5 mg). Safety protocols, including equipment checks and rescue drug verification, were rigorously followed.

In the operating room, standard monitoring was established: electrocardiography, pulse oximetry, non-invasive blood pressure, temperature, capnography, and bispectral index (BIS). A Foley catheter was inserted for urine output monitoring. After peripheral venous access (20G) was obtained in the right upper limb, supplemental oxygen (2 L/min) was administered. Initial sedation was performed with fentanyl (50 mcg) and midazolam (5 mg).

For epidural anesthesia, the patient was positioned in the seated position. A single puncture at T9–T10 was performed using an 18G Tuohy needle, without complications. The test dose was negative, and ropivacaine 0.5% (40 mL) plus morphine (0.3 mg) were administered slowly and fractionally. The epidural catheter was successfully inserted. After the block, the patient was repositioned in the supine position and preoxygenated with 100% oxygen (5 L/min via face mask).

Gradual intravenous induction was carried out with fentanyl (150 mcg), lidocaine without vasoconstrictor (50 mg), rocuronium (50 mg), and a target-controlled propofol infusion (target 3.5 µg/mL). Orotracheal intubation was performed under videolaryngoscopic guidance (McGrath, blade 3) after periglottic lidocaine atomization.

During atomization, the tip of the atomizer (Mucosal Atomization Device – GCMEDICA®) accidentally detached and was aspirated into the trachea. An attempt to retrieve it was made using a 4.5 mm orotracheal cannula, inflating the cuff and applying gentle traction, but it was unsuccessful. The orotracheal tube was left in place, and mechanical ventilation was started with low parameters, without PEEP and without inspiratory plateau.

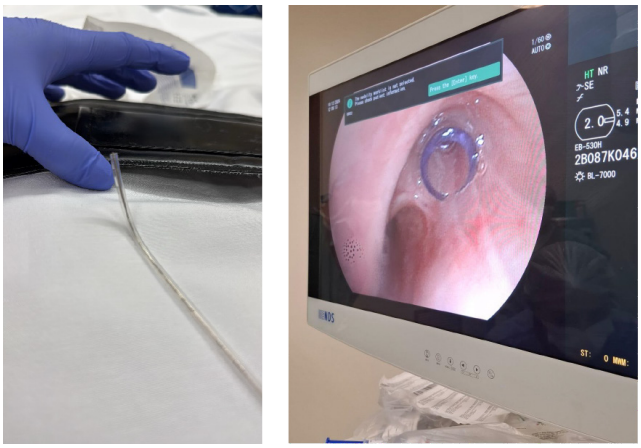

Figure 1. Atomizer without the tip / atomizer tip inside the airway

In coordination with the medical team, bronchoscopy was performed to remove the foreign body. The scope was introduced parallel to the orotracheal tube, and the fragment was located and successfully removed on the first attempt using extraction forceps. After removal, the cuff of the tube was deflated to facilitate withdrawal of the tube and passage of the scope, minimizing the risk of airway injury.

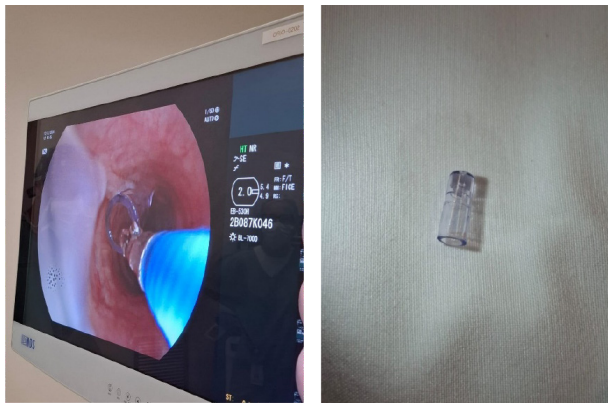

Figure 2. Bronchofibroscopy showing grasping of the atomizer tip / atomizer tip after removal from the airway.

Immediately after removal of the foreign body, a new videolaryngoscopy was performed, followed by orotracheal intubation with a 7.0 mm cuffed tube using a bougie. Intubation was confirmed by capnography and bilateral lung auscultation. Ventilatory parameters were adjusted to a tidal volume of 450 mL, respiratory rate of 11 breaths per minute, maximum airway pressure of 30 cmH_2O, and PEEP of 5 cmH_2O. Three alveolar recruitment maneuvers were performed.

The surgical procedure lasted 8 hours. Anesthetic maintenance was achieved with intravenous propofol infusion (target 3.5 µg/mL), combined with intermittent doses of fentanyl, midazolam, and

rocuronium. Additional doses of ropivacaine were administered through the epidural catheter. The patient's positioning was carefully maintained, with thermal protection, extremity padding, and continuous hemodynamic monitoring.

At the end of the procedure, the patient was reversed with sugammadex (200 mg) and awoke calmly. Extubation occurred without complications or pain. The epidural catheter was removed without difficulty. The patient was transferred to the post-anesthesia care unit, where she remained for 80 minutes. After achieving a score of 10 on the Aldrete and Kroulik scale, she was discharged to the ward.

DISCUSSION

Foreign body aspiration during intubation, although rare, requires rapid and effective management to prevent complications, as noted by Sands et al.[2] The team's readiness to identify the event and the availability of bronchoscopy were crucial for the successful removal of the fragment. This case illustrates the importance of continuous vigilance and preparedness for unexpected situations in anesthesia. Appropriate airway management and adequate mechanical ventilation following foreign body removal were fundamental for the patient's pulmonary recovery.

Although more common in children, aspiration can also occur in adults - particularly in the context of general anesthesia, deep sedation, or airway manipulation - as described by Farkas et al.[3] This report highlights the aspiration of the tip of an atomizer (Mucosal Atomization Device) during periglottic anesthesia, requiring bronchoscopic intervention for foreign body removal and subsequent orotracheal reintubation.

Several reports in the literature corroborate the possibility of similar iatrogenic events. In a review of 38 cases of foreign body aspiration in adults, Wang et al. found that most incidents occurred in patients with altered levels of consciousness or during anesthesia. The authors emphasize the effectiveness of bronchoscopy under general anesthesia, with a 97.4% success rate, as a safe and efficient approach for the removal of these foreign bodies.[5]

Similar situations have been described in other publications. Cho et al. reported the aspiration of a connector from an improvised nebulizer during general anesthesia in an asthmatic patient, highlighting the importance of attention when using modified or nonstandard equipment. Rapid bronchoscopic intervention allowed safe removal of the foreign body, preventing severe respiratory complications.[6] Mohnssen and Greggs described iatrogenic aspiration of components from respiratory devices, such as a washer from a closed suction system and the metallic tip of an intubation stylet, reinforcing the need for rigorous inspection of airway equipment.[7]

An alert issued by the United Kingdom's National Patient Safety Agency emphasizes that small loose or unidentified objects may inadvertently be introduced into the airway during intubation, ventilation, or anesthetic maneuvers. The agency recommends preventive measures such as prior inspection of all devices, replacement of equipment with unsecured moving parts, and keeping materials covered until use to prevent contamination and aspiration.[1]

This case reinforces the importance of standardizing devices used in anesthetic practice. Structural failure of a seemingly simple item—such as a lidocaine atomizer—can lead to a serious event. The actions taken by the team, including immediate communication, bronchoscopy, and guided reintubation, were decisive for the favorable outcome, with no airway injury and no compromise to the continuation of the surgical procedure.

Furthermore, this case highlights the relevance of preparing the anesthesia team for emergencies

of this nature, ensuring the availability of equipment and training in advanced airway management techniques. Active vigilance and the implementation of safety protocols, such as preoperative equipment checklists, should be reinforced to prevent such incidents.

CONCLUSION

This report highlights a successful case of foreign body removal from the airway by bronchoscopy during anesthetic induction, followed by an uncomplicated respiratory recovery. Team coordination and the availability of resources were decisive for the favorable outcome. This case contributes to the literature by describing a rare event, emphasizing the importance of thorough inspection of medical devices and the prompt response of the multidisciplinary team when faced with adverse situations.

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MAILING ADDRESS

GIULLIANO GARDENGHI
CET – CLIANEST, R. T-32, 279 - St. Bueno, Goiânia-Goiás- Brazil.
E-mail: coordenacao.cientifica@ceafi.edu.br

EDITORIAL AND REVIEW

Authors:
ESTEVAM BORGES LOPES - http://lattes.cnpq.br/5104171664385663 - https://orcid.org/0009-0009-5137-5922

MATHEUS SILVA DE OLIVEIRA - http://lattes.cnpq.br/9334250949525813 - https://orcid.org/0000-0002-9936-1556

GABRIEL PEIXOTO NASCIMENTO - http://lattes.cnpq.br/1553201526937403 - https://orcid.org/0000-0002-6607-7110

HUGO SERGIO DE OLIVEIRA GOMES - http://lattes.cnpq.br/8545871299187093 - https://orcid.org/0009-0004-6334-4019

GUSTAVO SIQUEIRA ELMIRO - http://lattes.cnpq.br/4765163399934337 - https://orcid.org/0000-0003-2113-8757

GULLIANO GARDENGHI - http://lattes.cnpq.br/1292197954351954 - https://orcid.org/0000-0002-8763-561X

Library Review: Izabella Goulart
Spell Check: Dario Alvares
Translation: Soledad Montalbetti
Received: 30/06/25. Accepted: 04/07/25. Published in: 18/11/25.