Tracheobronchial Aspiration of a Tracheostomy Tube Cleaning Brush in a Laryngectomized Patient

Case Report

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Abstract

Tracheobronchial foreign body aspiration is rare among patients who have undergone total laryngectomy. In this report, we describe a case involving a 75-year-old laryngectomized male patient who aspirated a tracheostomy tube cleaning brush. The brush was successfully removed without any complications in an office setting with the assistance of flexible and 70-degree rigid endoscopes, as well as forceps.

Keywords: Airway obstruction, foreign body, laryngectomy, respiratory aspiration, tracheostomy, case report

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Cite this article as: *Ünsal N, Kaya A, Bayram A, Yaşar M, Özcan İ. Tracheobronchial aspiration of a tracheostomy tube cleaning brush in a laryngectomized patient. Turk Arch Otorhinolaryngol. 2025; 63(3): 161-163*

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Received Date: 09.02.2025
Accepted Date: 29.04.2025
Epub: 04.05.2025
Publication Date: 26.09.2025

DOI: 10.4274/tao.2025.2025-2-6

Introduction

Patients who have undergone total laryngectomy are at an increased risk for tracheobronchial foreign body aspiration (TBFBA) due to the direct accessibility of the stoma located at the front of the neck (1). However, reports of TBFBA in laryngectomized patients are relatively rare in the literature, with most documented cases involving the aspiration of voice prostheses (2). In this case report, we describe tracheobronchial aspiration and subsequent removal of a tracheostomy tube cleaning brush in a laryngectomized patient.

Case Presentation

A 75-year-old male patient who had undergone total laryngectomy and bilateral neck dissection for laryngeal squamous cell carcinoma two years earlier presented to our clinic with severe respiratory distress approximately one hour after aspirating a brush used for cleaning a tracheostomy cannula. Examination of the trachea revealed that a tracheostomy tube cleaning brush, approximately 15 cm in length, was lodged within the trachea, nearly obstructing the left main bronchus (Figure 1). The metal part of the brush was gently grasped with forceps and carefully removed with the aid of a flexible fiberoptic endoscope and a 70-degree endoscope (Figure 2). Remarkably, the patient tolerated the procedure well and without the need for any topical anaesthesia, resulting in immediate recovery without complications. Radiological examination could not be performed due to the patient's respiratory distress, which required urgent intervention. The patient had no previous history of any medical conditions aside from laryngeal carcinoma, including mental health disorders. Although we suspected that the patient had used a brush to clean stomal and tracheal secretions and that the incident occurred during

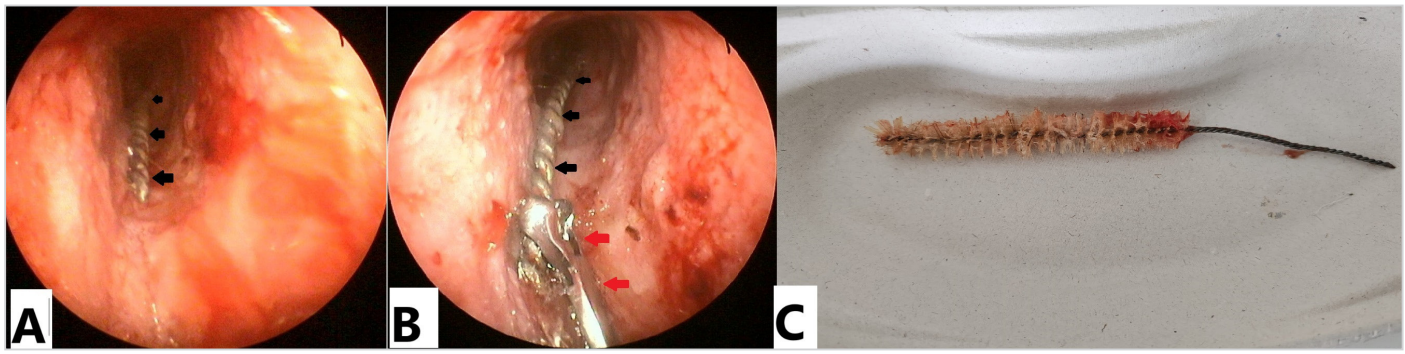

Figure 1. The aspirated foreign body. **A)** 70-degree rigid endoscope showing the metal part of the brush located in the trachea (black arrows), **B)** The metal part of the brush was gently grasped with forceps (red arrows), **C)** The aspirated tracheostomy tube cleaning brush

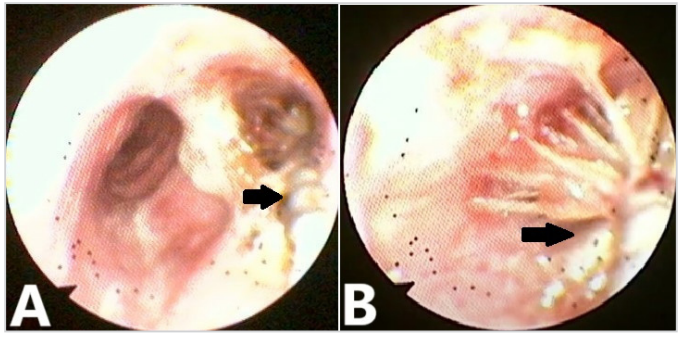

Figure 2. A-B) A flexible endoscope showing the near-total obstruction of the left main bronchus with brush (black arrows)

this process, the patient refused to provide any details about how it happened and did not wish to give an explanation. Informed consent was obtained from the patient for the writing of this case report.

Discussion

TBFBA in a laryngectomized patient can be a life-threating condition due to the occurrence of severe respiratory distress. In such a condition, a prompt intervention for the removal of the foreign body is mandatory. Although a permanent stoma theoretically increases the susceptibility of laryngectomized patients to TBFBA, fortunately, it remains a rare occurrence in their daily lives (2). In 1982 Cannon (3) documented the first case of an aspirated foreign body-a tracheostomy stomal button used to maintain stoma patency-following total laryngectomy. Since then, a variety of foreign bodies aspirated by laryngectomized or tracheostomized patients has been reported in the literature, including a voice prosthesis, a voice prosthesis cleaning brush, a Phillips-head screw, fractured metallic tracheostomy tube or fractured polyvinyl chloride tracheostomy tube, an inner cannula, and a wooden stick (1,2,4-9). In this case report, we described the tracheobronchial aspiration of a 15-cm-long tracheostomy tube cleaning brush. Gündüz et al. (10) reported a similar case, and to the best of our knowledge, we are providing the second published case of a laryngectomized patient with tracheostomy tube cleaning brush aspiration. In the report by Gündüz et al. (10), the patient stated that the brush was aspirated during the cleaning of a tracheostomy tube. The patient presented to the hospital 15 days after aspiration with shortness of breath, fever, and cough. On the contrary, our patient was admitted to our outpatient clinic with severe respiratory distress that required an immediate intervention to remove the foreign body. However, we were unable to determine how the patient aspirated the cleaning brush. Uzaslan et al. (9) reported a case of tracheobronchial aspiration involving a wooden stick covered with cotton in a laryngectomized patient who had been using it to clean secretions. In our case, although we suspected that the patient had also aspirated the cleaning brush while cleaning the secretions around the stoma, the patient refused to explain how the aspiration had occurred. Despite further questioning, he did not provide any details about the incident. The patient came to the outpatient clinic alone, and we later learned that the patient lived alone.

The clinical symptoms of TBFBA in laryngectomized and tracheostomized patients are highly variable, ranging from asymptomatic or mild symptoms to severe cases of acute respiratory distress (1,8,11). In the four-case series reported by Mahattanasakul et al. (5), all patients experienced sudden-onset dyspnea, two had severe cough, and one developed cardiac arrest. In the three cases who did not develop cardiac arrest, the average duration of symptoms ranged from two hours to two days. In such patients, the sudden onset of respiratory distress should immediately raise concern for the possibility of foreign body aspiration. A detailed clinical history as well as physical and radiological examinations are commonly done for the diagnosis (12). Rigid and flexible bronchoscopies are the preferred techniques for diagnosing and treating foreign body aspiration (6). However, particularly rigid bronchoscopy can be more challenging in laryngectomized patients because of the position of the stoma, stomal narrowing and the stiffening of neck tissues

often caused by radiotherapy (1). In cases of severe respiratory distress, particularly in outpatient settings, flexible and/or rigid endoscopy may serve as the primary diagnostic tool. In a similar scenario, in the presented case, flexible and 70-degree rigid endoscopes were employed as the first-line diagnostic approach, and simultaneous intervention to remove the foreign body was performed successfully. The procedure was surprisingly well-tolerated by the patient without utilizing any topical anaesthesia or intravenous sedation.

Conclusion

We treated a patient with tracheobronchial aspiration to remove a tracheostomy tube cleaning brush in an office setting with the assistance of flexible and 70-degree rigid endoscopes. TBFBA in laryngectomized patients can lead to severe respiratory distress, necessitating urgent hospital transport and prompt intervention, which can be lifesaving. In such cases, flexible and rigid endoscopes can serve as practical and effective tools for diagnosing and removing foreign bodies without causing any severe complications.

Ethics

Informed Consent: Informed consent was obtained from the patient for the writing of this case report.

Footnotes

Authorship Contributions

Concept: N.Ü., A.K., A.B., M.Y., İ.Ö., Design: N.Ü., A.K., A.B., M.Y., İ.Ö., Data Collection and/or Processing: N.Ü., A.B., İ.Ö., Analysis and/or Interpretation: N.Ü., A.B., İ.Ö., Literature Search: N.Ü., Writing: N.Ü., A.B.

Conflict of Interest: The authors declare that they have no conflict of interest.

Financial Disclosure: The authors declare that this study has received no financial support.

Main Points

- Rare but serious condition: Tracheobronchial foreign body aspiration (TBFBA) is rare in laryngectomized patients but can lead to life-threatening respiratory distress.
- Uncommon foreign body: This case report presents a unique instance of a tracheostomy tube cleaning brush aspiration, making it the second reported case in the literature.
- Urgent intervention required: TBFBA should be considered in any laryngectomized patient presenting with sudden respiratory distress, necessitating immediate removal of the foreign body.
- Successful removal without anesthesia: The foreign body was successfully extracted in an office setting using flexible and 70-degree rigid endoscopes without the need for anesthesia or sedation.
- Endoscopic approach as a primary tool: In cases of severe respiratory distress, flexible and rigid endoscopes and forceps can be valuable first-line diagnostic and therapeutic tools that help to avoid the need for more invasive procedures.

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