

## CASE REPORT

# A rare case of foreign body aspiration presenting as subglottic stenosis: A case report

Deepak Paudel | Raunak Dahal  | Bajarang Prasad Sah | Shyam Thapa Chettri | Pravid Gajurel

Department of ENT and Head & Neck Surgery, BPKIHS, Dharan, Nepal

**Correspondence**

Raunak Dahal, Department of ENT and Head & Neck Surgery, BPKIHS, Dharan 56700, Nepal.

Email: raunakdahal11@gmail.com

**Funding information**

None

**Abstract**

In rare cases, foreign body aspiration may present with similar clinical features and CT findings to subglottic stenosis. A high index of suspicion and additional diagnostic techniques may be required to distinguish them.

**KEYWORDS**

bronchoscopy, foreign body, partial hanging, subglottic stenosis

## 1 | INTRODUCTION

It is a rare event that a patient suspected to have subglottic stenosis has a foreign body aspiration. We report a case suspected to have subglottic stenosis secondary to partial hanging, prolonged intubation, and tracheostomy. However, surprisingly, the rigid bronchoscopy revealed a betel nut at the level of the carina.

Sixty to eighty percent of foreign body aspiration (FBA) occurs in childhood, mainly affecting those between 1 and 3 years, though all age groups are at risk.<sup>1</sup> FBA is the fourth most common cause of accident-related mortality in children less than 3 years.<sup>2</sup> Sudden-onset coughing and cyanosis are the usual symptoms at presentation.<sup>3</sup> Nonetheless, a lack of these symptoms may lead to delayed diagnosis.<sup>4</sup>

Subglottic stenosis is either congenital or acquired, with the latter being encountered more frequently. The most common cause of acquired subglottic stenosis is trauma, which can be internal (prolonged endotracheal intubation, tracheostomy, flame burn injury) or external (blunt or penetrating neck trauma).<sup>5,6</sup> Here, we present an interesting case of FBA masquerading acquired subglottic stenosis.

## 2 | CASE HISTORY

A thirteen years old girl presented to ear, nose, and throat (ENT) outpatient department (OPD) of our institute with chief complaints of shortness of breath and throat pain for 4 days. One month back, she had made a failed suicide attempt by partial hanging. However, immediate intensive care unit (ICU) admission and intubation in a nearby healthcare center saved her life. After 5 days, considering her stable vitals, she was extubated but unfortunately, she developed difficulty in breathing. Consequently, she was tracheostomized for additional 20 days. Following this, decannulation of the tube was done but she showed no signs of improvement and was referred to our center. When she presented to us, she had noisy breathing with stridor and a  $3 \times 1 \text{ cm}^2$  stoma on the anterior neck. She had labored respiration with an increased rate and use of accessory muscles. These history and clinical findings led us to suspect subglottic stenosis, and she was admitted for further evaluation and treatment.

This is an open access article under the terms of the Creative Commons Attribution-NonCommercial-NoDerivs License, which permits use and distribution in any medium, provided the original work is properly cited, the use is non-commercial and no modifications or adaptations are made.

© 2021 The Authors. *Clinical Case Reports* published by John Wiley & Sons Ltd.

### 3 | INVESTIGATIONS AND TREATMENT

We kept her under injectable antibiotics and corticosteroids and did computed tomography (CT) scan of her neck. CT showed “a soft tissue attenuating thick band-like structure causing luminal narrowing extending obliquely from the right posterolateral wall of subglottic portion of the larynx to the left anterolateral wall of proximal trachea likely granuloma/ inflammatory membrane” (Figure 1). Based on examination, and imaging, the diagnosis of subglottic stenosis was made, and for accurate pre-operative assessment of the site, length, and degree of stenosis, rigid bronchoscopy was done under general anesthesia. However, to our surprise, it revealed a betel nut in the bronchus. It measured  $2 \times 1 \text{ cm}^2$ , was covered with mucin, blackish debris, and granulation tissue, and was lodged in the tracheal lumen just above the carina with no evidence of subglottic stenosis (Figures 2 and 3). The betel nut was then removed.

### 4 | OUTCOME AND FOLLOW-UP

When she regained consciousness, she could breathe easily and the stridor was gone and her postoperative course was uneventful. Her psychiatry consultation was also done and was diagnosed as “Intentional Self Harm by hanging (impulsive) with borderline personality trait” and was started on olanzapine. She was then discharged on 2nd postoperative day. Repeat bronchoscopic evaluation was done after 3 months which was normal. Currently, she is



**FIGURE 1** Preoperative CT scan of the patient showing soft tissue attenuating thick band-like structure causing luminal narrowing

on regular follow-up in both ENT and psychiatry OPD and has no complaints related to airway compromise.

### 5 | DISCUSSION

Foreign body aspiration demands timely diagnosis and treatment. History of choking (most specific), cough, dyspnea, decreased breath sound, wheeze, and stridor point toward FBA.<sup>3</sup> Usually in children, history of choking or witness of the event are missing, leading to delayed diagnosis and increased risk of complications.<sup>4</sup> Our case was unique as the patient developed shortness of breath after an attempt of partial hanging and intubation and tracheostomy to follow. This history compelled us to make the provisional diagnosis of subglottic stenosis without a second thought.

The sensitivity of CT scan for the detection of bronchial foreign body (FB) is close to 100% with specificity between 66.7 and 100% and very few false-negative.<sup>7</sup> Qiu et al. found a false-negative rate of about 7%, and it depended upon endobronchial inflammatory exudate, tracheobronchial stenosis, or obstruction, which may cover up the sign of an intrabronchial foreign body. When they are aspirated into the trachea or bronchus, they are often located in parallel with the bronchial lumen, so the layer images of CT may miss the signs of FB.<sup>8,9</sup> In our case also, the CT scan missed the foreign body possibly because of the granulation tissue and inflammatory exudate. Sink et al.<sup>4</sup> concluded that FBA presents with varied symptoms and the presence of any radiologic finding suggests proceeding with endoscopy as a foreign body is probable. Rigid bronchoscopy under general anesthesia is standard of care as a diagnostic and therapeutic tool in FBA management.<sup>10</sup> These statements are relatable to our scenario as well.

The study done by Karakoc et al. revealed that inorganic foreign bodies are more common in adolescents. Due to radiopaque nature and positive history of aspiration, this kind of FBA is diagnosed promptly. On the other hand, organic FBA has delayed diagnosis with increased risk of complication like pneumonia, bronchiectasis, and bronchial fistula, and it can even get secondarily dislodged and cause acute respiratory deterioration.<sup>11,12</sup> However, Alsan et al.<sup>13</sup> revealed that aspiration of organic FB is more common than inorganic FB and peanut was the most commonly aspirated material in pediatric patients. In our case also, it was an organic FB, that is, betel nut and the diagnosis was also delayed significantly. Airway stenosis due to long-standing foreign body is underrated in the literature as only pneumonia, bronchiectasis, and fistulas are described in most of the literature. Any impacted FB causes mucosal trauma to the airway lumen and initiates the formation of granulation tissue around it which then leads to cicatrization and airway stenosis. The process of stenosis may progress even

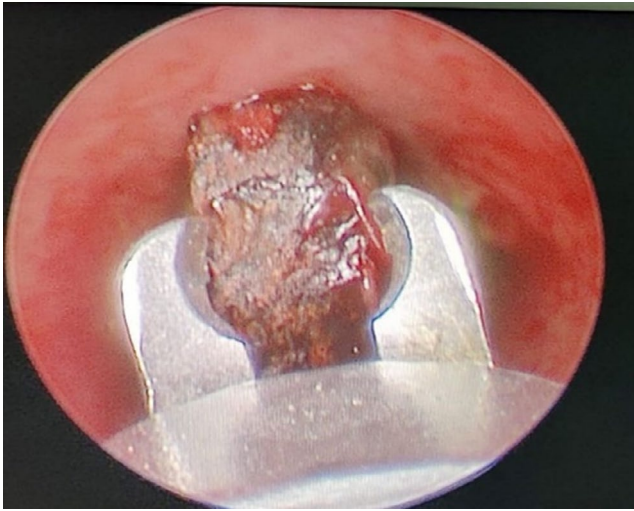


FIGURE 2 Intraoperative picture of the foreign body



FIGURE 3 Picture of betel nut after removal

after removing the foreign body signifying the need for periodic postoperative bronchoscopic evaluation.<sup>14</sup> Hence, we kept our case in regular follow-up and did repeat bronchoscopy in three months which was normal.

In conclusion, foreign body aspiration is a life-threatening condition and requires prompt diagnosis and treatment with rigid bronchoscopy under general anesthesia. However, in rare circumstances, the clinical scenario, symptoms, and even CT scan may mimic those of subglottic stenosis. Hence, a high index of suspicion and further diagnostic evaluation with bronchoscopy is essential to make an accurate diagnosis.

#### ACKNOWLEDGEMENT

I would like to thank Dr. Dibya Raj Mishra and Dr. Sabin Bhandari for their intraoperative assistance to manage the patient and Dr. Bibisha Baaniya for her help in making manuscript.

#### CONFLICTS OF INTEREST

None.

#### AUTHOR CONTRIBUTIONS

Author 1 gave idea and prepared the manuscript. Author 2 edited and reviewed the manuscript. Author 3, author 4, and author 5 involved in diagnosis and intraoperative assistance.

#### CONSENT

Patient's parents provided written consent for publication of this case report.

#### DATA AVAILABILITY STATEMENT

Data will be made available upon request.

#### ORCID

Raunak Dahal  <https://orcid.org/0000-0002-3428-8917>

#### REFERENCES

- Darrow DH, Hollinger LD. Foreign bodies in the larynx, trachea, and bronchi. In: Bluestone CD, Stool S, Kenna MA, eds. *Pediatric Otolaryngology*. W.B. Saunders; 1996:1390-1401.
- Rodríguez H, Passali GC, Gregori D, et al. Management of foreign bodies in the airway and oesophagus. *Int J Pediatr Otorhinolaryngol*. 2012;76(Suppl 1):S84-S91.
- Jung SY, Pae SY, Chung SM, Kim HS. Three-dimensional CT with virtual bronchoscopy: a useful modality for bronchial foreign bodies in pediatric patients. *Eur Arch Otorhinolaryngol*. 2012;269(1):223-228. 1.
- Sink JR, Kitsko DJ, Georg MW, Winger DG, Simons JP. Predictors of foreign body aspiration in children. *Otolaryngol - Head Neck Surg (United States)*. 2016;155(3):501-507.
- Shott SR. Down syndrome: analysis of airway size and a guide for appropriate intubation. *Laryngoscope*. 2000;110(4):585-592.
- Blanchard M, Leboulanger N, Thierry B, et al. Management specificities of congenital laryngeal stenosis: external and endoscopic approaches. *Laryngoscope*. 2014;124(4):1013-1018.
- Hong SJ, Goo HW, Roh JL. Utility of spiral and cine CT scans in pediatric patients suspected of aspirating radiolucent foreign bodies. *Otolaryngol Head Neck Surg*. 2008;138(5):576-580.
- Wu X, Wu L, Chen Z, Zhou Y. Fatal choking in infants and children treated in a pediatric intensive care unit: a 7-year experience. *Int J Pediatr Otorhinolaryngol*. 2018;110:67-69.
- Qiu W, Wu L, Chen Z. Foreign body aspiration in children with negative multi-detector computed tomography results: own experience during 2011-2018. *Int J Pediatr Otorhinolaryngol*. 2019;124:90-93.
- Fidkowski CW, Zheng H, Firth PG. The anesthetic considerations of tracheobronchial foreign bodies in children: a literature review of 12,979 cases. *Anesth Analg*. 2010;111(4):1016-1025.
- Karakoç F, Karadağ B, Akbenlioğlu C, et al. Foreign body aspiration: what is the outcome? *Pediatr Pulmonol*. 2002;34(1):30-36.
- Boufersaoui A, Smati L, Benhalla KN, et al. Foreign body aspiration in children: experience from 2624 patients. *Int J Pediatr Otorhinolaryngol*. 2013;77(10):1683-1688.

13. Aslan N, Yıldızdaş D, Özden Ö, Yöntem A, Horoz ÖÖ, Kılıç S. Evaluation of foreign body aspiration cases in our pediatric intensive care unit: Single-center experience. *Turk Pediatri Ars*. 2019;54(1):44-48.
14. Mehta RM, Rashmi N, Bajaj P, Krishnan S, Srinivasan L. Airway stenosis related to foreign body aspiration: an under-recognized long term complication. *Clin Med Insights Case Rep*. 2019;12:1179547619863816.

**How to cite this article:** Paudel D, Dahal R, Sah BP, Chettri ST, Gajurel P. A rare case of foreign body aspiration presenting as subglottic stenosis: A case report. *Clin Case Rep*. 2021;9:e04992. <https://doi.org/10.1002/ccr3.4992>