

Foreign Bodies in the Lower Airways: Patient Pathways and Management at the ENT Department of Donka National Hospital, Guinea

Ibrahima Diallo^{1*}, Mamadou Mouctar Ramata Diallo², Ismaël Dabo³, Sayon Kourouma⁴, Mamadou Aliou Diallo⁵, Alseny Camara¹, Alseny Cissé⁶, Raphan Mady Kaba Keïta⁷, Aminata G. Diallo⁸, Mamadou Cellou Bah¹, Youssouf Bapaté Barry¹, Alpha Oumar Barry¹, Abdoulaye Bayo¹, Mohamed Casimir Kaman¹, Abdoulaye Keita¹, Alpha Oumar Diallo⁸

¹Department of ENT-Head and Neck Surgery, Donka National Hospital, CHU of Conakry, Conakry, Guinea

²Department of ENT-Head and Neck Surgery, Mamou Regional Hospital, Mamou, Guinea

³Department of ENT-Head and Neck Surgery, Conakry Military Hospital, CHU of Conakry, Conakry, Guinea

⁴Department of ENT-Head and Neck Surgery, Conakry Military University Hospital, Conakry, Guinea

⁵Department of ENT-Head and Neck Surgery, Entag Regional Hospital, Conakry, Guinea

⁶Department of ENT-Head and Neck Surgery, Labe Regional Hospital, Labe, Guinea

⁷Department of ENT-Head and Neck Surgery, NZerekore Regional Hospital, NZerekore, Guinea

⁸Department of ENT-Head and Neck Surgery, Ignace Deen National Hospital, CHU of Conakry, Conakry, Guinea

Email: *ibrahimaorl2@gmail.com

How to cite this paper: Diallo, I., Diallo, M.M.R., Dabo, I., Kourouma, S., Diallo, M.A., Camara, A., Cissé, A., Keïta, R.M.K., Diallo, A.G., Bah, M.C., Barry, Y.B., Barry, A.O., Bayo, A., Kaman, M.C., Keita, A. and Diallo, A.O. (2025) Foreign Bodies in the Lower Airways: Patient Pathways and Management at the ENT Department of Donka National Hospital, Guinea. *International Journal of Otolaryngology and Head & Neck Surgery*, 14, 39-46.

<https://doi.org/10.4236/ijohns.2025.141005>

Received: December 9, 2024

Accepted: January 12, 2025

Published: January 15, 2025

Copyright © 2025 by author(s) and Scientific Research Publishing Inc. This work is licensed under the Creative Commons Attribution International License (CC BY 4.0).

<http://creativecommons.org/licenses/by/4.0/>



Open Access

Abstract

Introduction: Foreign bodies (FB) in the lower airways (LAs) constitute a potentially life-threatening emergency requiring immediate management. The objective of our study was to describe the patient pathway and management of foreign bodies in the lower airways. **Methodology:** This was a descriptive study with retrospective data collection conducted over a 6-year period (January 1, 2014, to December 31, 2019) in the ENT and Head and Neck Surgery Department of Donka National Hospital. **Results:** We observed a prevalence of 1.79%. The average age was 5.71 years, with a sex ratio of 1.2. However, 82.61% of the cases originated from rural areas. We noted that 78.83% of patients were referred after visiting 1 to 2 healthcare facilities (75.36%). The consultation delay was 3 days. Penetration syndrome was present in 98.56% of cases. The foreign body incidents occurred during play in 54.84% and during meals in 29.09% of cases. Radiographs were performed in 93.9% of cases. Endoscopy was used for both diagnostic and therapeutic purposes in all patients. The foreign bodies were located in the trachea (37.68%), larynx (26.08%), and bronchi (21.73%). Non-organic foreign bodies were predominant (52.17%). Postoperative outcomes were uncomplicated in 95.98% of cases, and the lethality rate was 2.85%. **Conclusion:** The pathway of patients with foreign

bodies in the airways remains unpredictable in our context due to parental hesitations. Early management reduces morbidity and mortality rates.

Keywords

Pathway, Foreign Bodies, Lower Airways, Treatment, Guinea

1. Introduction

A foreign body in the lower airways can be defined as a substance or object that is improperly located in the larynx, trachea, or bronchi [1]. Foreign bodies in the lower airways are more frequently encountered in children than in adults [2]. This is a potentially life-threatening emergency requiring early management. In this context, the pathway of patients with a foreign body in the lower airways is often complex. These patients are identified by the presence of a penetration syndrome, prompting exploration of the lower airways through endoscopy [3]-[5], which serves both diagnostic and therapeutic purposes [6]. Delay in consulting for lower airway foreign bodies can jeopardize the prognosis of patients [7]. The severity depends on the degree of obstruction and the location of the foreign body within the respiratory tree [1]. Therefore, the aim is to describe the pathway of patients with a foreign body in the lower airways and their management in a Sub-Saharan ENT and Head and Neck Surgery Department.

2. Methodology

This is a descriptive study with retrospective data collection conducted over a period of six years (January 1, 2014, to December 31, 2019) in the ENT and Head and Neck Surgery Department of Donka National Hospital. The study included all complete medical records of patients managed for a foreign body in the lower airways, regardless of race or gender, and who underwent rigid endoscopy. Incomplete records were excluded. An exhaustive sampling method was used. The following parameters were studied: the patient pathway, epidemiology, diagnosis, therapy, and outcomes. Qualitative data were presented as proportions, while quantitative data were expressed as means \pm standard deviation and ranges. Data analysis was performed using SPSS software version 22. Medical confidentiality was strictly maintained, and the results were used exclusively for scientific purposes.

3. Results

We collected 69 cases of foreign bodies in the lower airways, representing a frequency of 1.79%. Children under the age of 15 accounted for 91.30% of the cases. The average age was 5.7 years, with extremes ranging from 1 to 12 years. Males accounted for 59.42% of cases, and females 40.58%, giving a sex ratio of 1.2. Students represented 65.22% of the cases; unemployed individuals, 14.49%; mechanics, 5.80%; housewives, 4.35%; traders and carpenters, 2.90% each; and tailors,

farmers, and unemployed individuals, 1.45% each. In terms of origin, 82.61% of the patients came from rural areas, and 17.39% from urban areas. Of the patients, 13.04% visited three to four healthcare facilities, while 75.36% visited one to two healthcare facilities. Referrals accounted for 88.83% of the cases, while 11.17% were direct consultations.

Penetration syndrome was present in 98.56% of cases, occurring during play in 54.84% and during meals in 29.09% of cases. Retention syndrome accounted for 1.44%. Laryngeal dyspnea and dysphonia were observed in 40% and 11.60% of cases, respectively. Pulmonary auscultation revealed crackles in 37.68% of cases and pulmonary silence in 19.56%. The consultation delay ranged from 1 to 7 days in 85.29% of cases, with an average of 3 days. In this series, 97.10% of patients underwent cervico-thoracic radiography (**Figure 1**), which revealed radiopaque images in 40.60% of cases and indirect signs in 20.34%.

Laryngotracheobronchoscopy was performed on all patients. The procedure identified 26.08% of foreign bodies in the larynx, 38.24% in the trachea, and 22.06% in the bronchi. Regarding the nature of the foreign bodies (**Table 1**), non-organic foreign bodies accounted for 71.01%, while organic foreign bodies made up 28.99% (**Figure 2**). All patients received postoperative care, including analgesics (93.74%), corticosteroids (95.13%), antibiotics (98.55%), and intravenous fluids (87.23%). Postoperative outcomes were uncomplicated in 95.98% of cases and complicated in 4.02%. The lethality rate was 2.85%.

Table 1. Distribution of patients by type of lower respiratory tract foreign body.

Type	Number	%
Non-organic		
Pearl	13	18.84
Piece of iron	9	13.04
Pebbles	5	7.25
Bead	5	7.25
Flat battery	4	5.80
Piece of plastic	4	5.80
Coin	3	4.35
Metal spring	2	2.90
Bic cap	2	2.90
Tip	1	1.45
Nut	1	1.45
Organic		
Fish bone	13	18.84
Meat bones	4	5.80
Peanut	1	1.45
Chicken bone	1	1.45
No found	1	1.45
TOTAL	69	100



Figure 1. Cervico-thoracic radiograph showing a radio-opaque image in favor of a bronchial foreign body.



Figure 2. Extraction of a pebble-like tracheal foreign body.

4. Discussion

In the present series, the limits were, among others. Insufficient data on referral and medical transport forms. Nevertheless, we have used the available data to arrive at a discussion.

In this series, we collected 69 cases of foreign bodies in the airways over six years. Our result is lower than that of Maiga S (2016) [5], who recorded 130 patient files for laryngo-tracheo-bronchial foreign bodies over a three-year period. This lower frequency is attributed to the study being conducted during the renovation of Donka Hospital, when the department was relocated to the Jean Paul II National Center for Applied Social Training (CNFSA-Jean Paul II). Today, the ENT

department at CNFSA-Jean Paul II has become a national reference center for the management of ENT and cervico-facial conditions. The average age was 5.7 years, whereas Hebazi A (2010) [8] found an average age of 16 years. Several reasons explain the vulnerability of this age group, including the natural tendency of infants and young children to put any objects within reach into their mouths, leading to accidental ingestion. Males were predominant (59.42%, sex ratio = 1.2). Nyeki A.R.N's team (2015) [9] also reported a male predominance (71.42%, ratio = 2.5). The male predominance is linked to the turbulence, more energetic temperament, and risk-taking behavior typical of boys during play, compared to girls. Students were the most affected group (65.22%). Our patients were relatively young, with the majority living outside Conakry (82.61%). We believe that the decentralization of ENT department or units to other parts of the country has helped improve patient referrals to the city center. While many of these services or units lack advanced medical equipment for managing lower airway foreign bodies, this could explain the high frequency in our study. We also found that patients consulted multiple healthcare facilities (3 or 4 medical centers). Indeed, the patient or parent pathway often remains ambiguous. They may travel long distances before reaching a hospital center where they may be seen by clinicians who are not familiar with penetration syndrome, thus delaying diagnosis. However, time is crucial when dealing with foreign bodies in the lower airways, as the severity depends on the degree of obstruction and the location of the foreign body within the lower respiratory tree. Factors such as the low socio-economic status of parents, non-medicalized transport, and the lack of coordination in patient referrals to a hospital center are significant obstacles to efficient patient management.

The penetration syndrome was present in 98.56% of the cases, which aligns with the literature. It forms the foundation of the diagnosis for foreign bodies in the airways, emphasizing the importance of a thorough patient interview. Indeed, some signs of this syndrome persisted, notably laryngeal dyspnea (40%) and dysphonia (11.6%). Our colleague Goueta A (2020) [10] noted 63.9% of laryngeal dyspnea and 26.2% of cough. Play was the predominant circumstance for inhalation (54.84%), followed by meals (29.09%). Our result differs from Mupepe A.K (2014) [11], who found that 100% of inhaled foreign bodies occurred during play. The average consultation delay in our study was 3 days, with 85.29% consulting within 1 to 7 days. However, Nao EEM (2013) [12] reported a longer average delay (37.12 days). The delay in consultation is linked to several factors, including long distances traveled by some patients from outside Conakry and diagnostic uncertainty among clinicians (general practitioners, pediatricians), especially in cases where penetration syndrome was not identified, leading to differential diagnoses such as bronchopneumonia, asthma, or laryngitis. In this series, 97.10% of patients underwent chest radiography. Keita A (2018) [13] noted 100% of chest radiography. Radiography remains more accessible and less expensive in our African regions compared to CT scans, which are typically performed for chronic

foreign bodies or diagnostic challenges. Inorganic foreign bodies accounted for 71.01%, while organic foreign bodies represented 28.99%. Djelouat O.O's team (2024) [14] found 26.58% of inorganic foreign bodies. Children under 3 years old tend to explore their environment by putting objects (toys, earrings) in their mouths. Beads were the most prevalent type of foreign body. Our findings differ from those of Goueta A [10] and Diallo AO [7], likely due to the context in each country. Beads are easier to identify compared to non-radio-opaque foreign bodies. However, their extraction requires appropriately specialized equipment.

Rigid tube endoscopy, used for both diagnostic and therapeutic purposes, was performed on all patients in this series. This observation aligns with several other studies [7] [10] [15]. Endoscopy is the only procedure that can thoroughly explore the entire laryngo-tracheobronchial tree, confirming the presence of a foreign body and allowing its extraction. Prolonged retention of a foreign body in the lower airways exposes the patient to significant morbidity and mortality. In our study, the mortality rate was 2.85%. This rate varies between different studies, but the primary concern when dealing with foreign bodies in the lower respiratory tract is the potential life-threatening risk that can arise at any moment, especially if the foreign body obstructs the larynx. In our study, 38.24% of the foreign bodies were located in the trachea. From this position, the foreign body can migrate into the bronchi or obstruct the carina, exacerbating respiratory distress. Therefore, we recommend greater coordination in administrative procedures and patient management. Efforts should be made to reduce the time for treatment, particularly by improving the technical facilities (endoscopic equipment) in ENT departments and units located outside the main urban areas. More specifically, as soon as a foreign body is suspected in the lower respiratory tract, the patient should consult the nearest health facility. The health worker must confirm the penetration syndrome and assess the severity of the respiratory distress. Facilitate transport of the patient to a specialized department (with the appropriate technical facilities for the management of foreign bodies in the lower respiratory tract) by medical transport, regardless of the patient's place of residence. Extraction should be carried out urgently by an experienced team (ENT specialist, anesthetist or pulmonologist), using an endoscopic approach (rigid or flexible). Rigorous post-operative monitoring is also essential. Preventive measures remain the most effective treatment, including avoiding placing objects of any kind in the mouth.

5. Conclusion

The inhalation of foreign bodies remains a significant public health issue. Foreign bodies in the lower airways are common in male children. They represent a true emergency and can pose a life-threatening risk. Prompt management is essential and requires excellent collaboration among healthcare providers. The patient journey is often prolonged and less organized. The extraction of these foreign bodies must be performed endoscopically, highlighting the importance of having endoscopic equipment available in ENT and Head and Neck Surgery departments.

Conflicts of Interest

The authors declare no conflicts of interest regarding the publication of this paper.

References

- [1] Diallo, I., Diallo, M.A., Poly, M.K., Camara, A., Keita, M.S., Keita, R.M.K., *et al.* (2024) Foreign Body Lodged in the Subglottic Area: A Case Report in a Child. *International Journal of Otorhinolaryngology and Head and Neck Surgery*, **10**, 732-734. <https://doi.org/10.18203/issn.2454-5929.ijohns20243516>
- [2] Goyal, R., Nayar, S., Gogia, P. and Garg, M. (2012) Extraction of Tracheobronchial Foreign Bodies in Children and Adults with Rigid and Flexible Bronchoscopy. *Journal of Bronchology & Interventional Pulmonology*, **19**, 35-43. <https://doi.org/10.1097/lbr.0b013e318244e591>
- [3] Mudunuri, R.K.R. (2015) Unusual Foreign Body in Nose and Nasopharynx—A Rare Case. *Journal of Clinical and Diagnostic Research*, **9**, MD1-MD2. <https://doi.org/10.7860/jcdr/2015/12115.5784>
- [4] Maiga, S., Barry, M.W., Diom, E.S. and Ndiaye, C. (2016) Corps étrangers laryngo-trachéo-bronchiques: À propos de 130 cas. *Medecine d'Afrique Noire*, **63**, 629-634.
- [5] Diop, E.M., Tall, A., Diouf, R. and Ndiaye, I.C. (2000) Corps étrangers laryngés: Prise en charge chez l'enfant au Sénégal. *Archives de Pédiatrie*, **7**, 10-15. [https://doi.org/10.1016/s0929-693x\(00\)88911-3](https://doi.org/10.1016/s0929-693x(00)88911-3)
- [6] David, A.P., Xu, M.J., Rosbe, K.W., Meyer, A.K., Gesthalter, Y.B. and Chan, D.K. (2019) Cryoprobe Retrieval of an Airway Foreign Body: A Case Report and Literature Review. *International Journal of Pediatric Otorhinolaryngology*, **125**, 79-81. <https://doi.org/10.1016/j.ijporl.2019.06.030>
- [7] Diallo, A.O., Keita, A., Balde, D., Conde, B., Diallo, M.T. and Sylla, A.V. (2018) Les Corps Étrangers en Otorhinolaryngologie: Analyse de 192 Cas au chu de Conakry. *Health Sciences and Diseases*, **19**, 61-65.
- [8] Hebbazi, A., Afif, H., El Khattabi, W., Aichane, A. and Bouayad, Z. (2010) L'épingle à foulard: Un nouveau corps étranger intrabronchique. *Revue des Maladies Respiratoires*, **27**, 724-728. <https://doi.org/10.1016/j.rmr.2010.06.021>
- [9] Nyeki, A.N., Miloundja, J., Dalil, A.B., Mandji Lawson, J.M., Nzenze, S., Emery, S., *et al.* (2015) Les corps étrangers laryngo-trachéo-bronchiques: Expérience de l'hôpital d'instruction des armées Omar Bongo Ondimba (HIAOBO) de Libreville. *Pan African Medical Journal*, **20**, Article No. 298. <https://doi.org/10.11604/pamj.2015.20.298.4576>
- [10] Gouéta, A., Diallo, I., Sanou, E., Ouedraogo, A., Gyebre, Y.M.C. and Ouedraogo, B.P. (2020) Corps étrangers ORL à propos de 603 cas: Une expérience de 5 ans. *Retec*, **1**, 25-33.
- [11] Mupepe, A.K., Mukuku, O., Bagale, Y. and Ruhindiza, B.M. (2014) Corps étranger métallique inhalé: 36 mois d'évolution intrabronchique chez un enfant de 8 ans. *Pan African Medical Journal*, **18**, Article No. 225. <https://doi.org/10.11604/pamj.2014.18.225.4823>
- [12] Ndiaye, M., *et al.* (2013) Les corps étrangers des voies respiratoires inférieures de l'enfant au chu de Dakar. *Journal Africain de Chirurgie*, **2**, 181-185. <https://doi.org/10.61585/pud-jafchir-v2n401>
- [13] Keita, A., Fofana, M., Diallo, M.A., Diallo, M.M.R., Sacko, S. and Diallo, I. (2018) Corps étrangers des voies aériennes inférieures à extraction difficile: À propos de 3 cas. *La Revue Africaine d'ORL et de Chirurgie Cervico-Faciale*, **18**, 24-28.

- [14] Djelouat, O.O., Abes, N., Makhloufi, H. and Benchaoui, M. (2024) L'exploration négative lors de la prise en charge du corps étranger inhalé. *Journal Algérien de Médecine*, **31**, 68-71.
- [15] Keita, A., Diallo, A.O., Fofana, M., Diallo, M.M.R., Conde, M. and Diallo, M.T. (2018) Endoscopie en ORL: Bilan de cinq ans dans le service d'ORL et de Chirurgie Cervico-Faciale à l'Hôpital National de Donka. *Médecine d'Afrique Noire*, **65**, 417-420.