ISSN: 3066-9812
Review Article

Journal of Clinical Epidemiology and Public Health

A Case of Tracheobronchial Foreign Body having Experienced a Spontaneous Favorable Resolution at the National Hospital of Zinder and Review of the Literature

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Submitted: 29 January 2024 **Accepted:** 05 February 2024 **Published:** 08 February 2024

https://doi.org/10.63620/MKJCEPH.2024.1013

Citation: *Ganiou Tidjani, K., Oumarou, K., Mamoudou, B., Hassan, M. L., & Magagi, A. (2024). A case of tracheobronchial foreign body having experienced a spontaneous favorable resolution at the National Hospital of Zinder and review of the literature. J of Clini Epi & Public Health, 2(1), 01-04.*

Abstract

Introduction: *Tracheobronchial foreign bodies are relatively common; and are mainly the prerogative of children aged 9 months to 6 years. Their extractions are usually done under bronchoscopy in the literature. The objective of our study is to report a favorable resolution of a case of tracheobronchial foreign body at the Zinder National Hospital in Niger.*

Observation: *This was a 6-year-old boy, referred for a chest x-ray with the indication of chronic cough for more than a year; on which a radiopaque foreign body located at the right tracheobronchial junction was observed. On clinical examination, no respiratory distress was noted. During the preoperative assessment and under prescription medication, we observed a spontaneous expulsion of the foreign body. The control chest x-ray came back normal.*

Conclusion: *Tracheobronchial foreign bodies constitute a diagnostic and therapeutic emergency. Penetration syndrome should always be looked for. Frontal chest radiography helps establish the diagnosis when the foreign body is radio opaque. Treatment involves bronchoscopy. We reported a case of ingestion of a tracheobronchial foreign body which resolved spontaneously at the Zinder National Hospital.*

Keywords: Foreign Body, Chest X-Ray, Bronchoscopy, Child, Niger

Introduction

The risk of inhaling a foreign body begins with grasping (at the age of 6 months) and reaches a peak around the age of 2 years. More than 50% of cases of bronchial foreign body inhalation in pediatrics concern children under 5 years of age [1]. Tracheobronchial foreign bodies are relatively common in our daily practice in medical imaging at the Zinder National Hospital in Niger, and are especially the prerogative of children aged 9 months to 6 years, according to numerous authors. Their extractions are usually done under bronchoscopy in the literature. The authors report a case of spontaneous exit of a right tracheobronchial foreign body.

Observation

This was a 6-year-old male subject, referred by the Oto-Rhino-Laryngology (ORL) department for a chest x-ray with the indication of a chronic cough which had started more than a year ago. A frontal chest X-ray was performed on site and revealed the presence of a radiopaque foreign body located at the right tracheobronchial junction (figure 1). The child was returned to the ORL department, where a medication prescription was made and the pre-operative assessment was initiated for foreign body extraction. Two days later, the father presented himself with the child to the medical imaging department for mobility of the foreign body (FB).

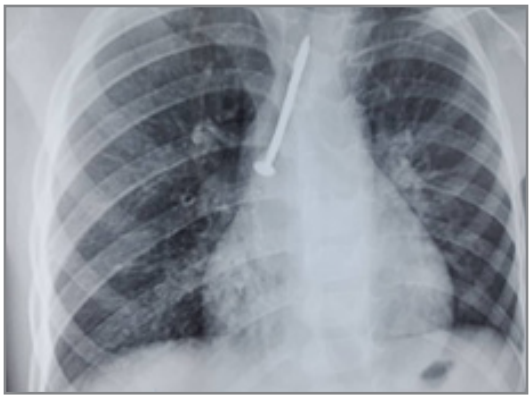

Figure 1: front chest x-ray showing a right tracheobronchial radiopaque foreign body

A second control chest X-ray showed that the foreign body was still in place (figure 2), the child returned home. Two hours later the father brought the child back with the foreign body in his hand, expelled spontaneously after episodes of coughing and vomiting. It was a nail wich measure 40 mm in longer and 3 mm in diameter. The third control chest X-ray came back normal (figure3).

Figure 2: frontal chest radiograph showing the persistence of the right tracheobronchial radiopaque

Figure 3: control frontal chest x-ray revealing no foreign body.

Discussion

The peak frequency belongs to the age group of 4 to 7 years in the series by Ngo Nyeki and al [2]. Our patient is 6 years old, but his inhalation dates back to the age of 5. In the literature, we note a predominance of the male sex [3-11]. Our case is also male. Inhaled foreign bodies are of organic and food origin (nuts, seeds, etc.) in 70% to 80% of cases according to studies and non-organic (plastic, metallic) in 20 to 30% of cases. Our patient belongs to this second group, since he inhaled metal. Mortality linked to FB inhalation is estimated at 0.42% in the review by Fidkowski and al. (10,236 cases of children treated in hospital). Epidemiological data. Recent German studies report a mortality rate ranging from 1% for the 1–15-year age group, up to 4% before 1 year (German national data for cases of FB inhalation between 2010 and 2014) [1].

The characteristic clinical presentation of FB inhalation is penetration syndrome: sudden episode of suffocation, followed by coughing with cyanosis or facial flushing. Penetration syndrome is described in the majority of cases by witnesses but can go unnoticed. Respiratory symptoms may then persist such as cough, wheezing, stridor, dyspnea, which makes it possible to assess the location of the FB (tracheal or bronchial) and the severity of the obstructive picture. In certain cases, the respiratory symptoms disappear after the penetration syndrome and late complications point towards the diagnosis of bronchial FB (chronic cough, pneumonia, recently discovered asthma, lingering bronchitis, etc.) [1].

In our case the penetration syndrome went unnoticed. The majority of foreign bodies are located in the bronchial tree (88% of cases), mainly in the right main bronchus. In 12% of cases the foreign body is tracheal. In rare cases the localization is bilateral (3%) [1]. In our patient, the foreign body is located in the right tracheobronchial region.

The first examination to be performed as quickly as possible is a frontal chest x-ray during inspiration and forced expiration, without delaying the treatment of a symptomatic foreign body with a life-threatening condition. A normal chest x-ray does not exclude the presence of FB.

The radiological elements suggestive of a foreign body are a radiopaque foreign body and/or ventilatory disorders such as atelectasis (lobar or pulmonary), localized obstructive emphysema, focus of pulmonary condensation or even abscess [1]. The chest x-ray of our patient revealed a right tracheobronchial foreign body, without any other associated anomaly.

The diagnostic tools are flexible bronchoscopy and radiology. The chest CT scan is more sensitive than the standard chest x-ray. The diagnostic delay for these FBs is often long, as was the case in our patient.

Therapeutic management of FB has been revolutionized by the development of flexible bronchoscopy. Success rates vary between 61 and 97% depending on the series [11]. Rigid bronchoscopy remains widely used, especially in otorhinolaryngology departments. These two techniques have considerably reduced the need for surgery. FB extraction is difficult in poor countries. The use of surgery varies between 6 and 10.4% [10, 11] in poor countries, reaching 13% when it comes to late diagnosis of FB. Management by flexible bronchoscopy, incidentally rigid bronchoscopy, is the most desirable.

FB extraction requires pediatric bronchoscopy. This requires a technical platform which is not always available and accessible. General anesthesia remains the safest technique to guarantee the successful completion of tracheobronchial endoscopy and allow extraction of the foreign body. It is nevertheless a high-risk anesthesia and the anesthetic modalities chosen must guarantee correct oxygenation and a sufficient depth of anesthesia, to allow tolerance of endoscopic maneuvers, in a patient at risk of complete obstruction of the airways.

The risk factors for intraoperative hypoxemia are young age, the duration of the endoscopy, the nature of the foreign body (vegetal), the existence of pneumopathy and the ventilatory mode (spontaneous ventilation). Removal of the foreign body remains a random procedure and the surgeon must be prepared to quickly perform a tracheotomy or crico-thyrotomy if the partial obstruction suddenly completes.

In the event of complete obstruction of the airways by entrapment of the foreign body in the trachea, if it cannot be extracted immediately, it must be pushed beyond the carina to allow oxygenation of the patient. If ventilation is impossible, everything must be done to enable rapid extraction of the foreign body. All these points underline the need for anesthetic care provided by an anesthetist experienced in pediatric anesthesia and close collaboration within the medical-surgical team.

During rigid tube endoscopy, severe iatrogenic complications have been described [12]. Their incidence is 0,96%: laryngospasm, bronchospasm, severe laryngeal edema, pneumothorax or pneumomediastinum, cardiac arrest, anoxo-ischemic encephalopathy, tracheal and bronchial lacerations. The risk of death associated with performing a bronchoscopy for foreign body extraction varies between 0 and 0.94% depending on the series. The majority of these deaths result from hypoxic cardiorespiratory arrest. In other cases, they may result from bronchial rupture, severe bronchospasm or an infectious complication. Given this morbidity and mortality, some authors have proposed reserving the indications for rigid tube endoscopy as first intention to situations where there is an asphyxial clinical picture, a radiopaque foreign body or signs very suggestive of an inhaled foreign body.

Our patient expelled the foreign body spontaneously, without any complications. In the literature, a case of foreign body neglected for 23 years, occurring in a 43-year-old subject, was reported by Marouf and al [13]. Extraction of a tracheobronchial foreign body using a uretheroscope, due to lack of adequate technical support and in the event of an emergency, was reported by Hicham and al [14].

Conclusion

Tracheobronchial foreign bodies are quite common in children. They constitute a diagnostic and therapeutic emergency. Penetration syndrome should always be looked for. Frontal chest radiography helps establish the diagnosis, if the FB is radio opaque. Treatment involves bronchoscopy. We reported a case of ingestion of a tracheobronchial foreign body which resolved spontaneously at the Zinder National Hospital in Niger.

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