
Research Article

Anesthesia for Removal of Foreign Bodies in Lower Respiratory Tracts in Souro Sanou University Hospital Center in Bobo-Dioulasso: About 46 Cases

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Summary

Introduction : The inhalation of foreign body is a common cause of respiratory distress in children. Anesthesia for this endoscopy represents a challenge for the anesthesiologist.

Objective: To assess the anesthetic management of foreign body extraction of the lower respiratory tracts in a context of limited resources.

Patients and methods: This is a retrospective study in descriptive aim, over 3 years from 1st January 2014 to 31st December 2016. It involved patients admitted for foreign bodies of the lower respiratory tracts in Resuscitation service and ENT in Souro Sanou University Hospital Center in Bobo-Dioulasso .

Results: A total of 46 patients were hospitalized for foreign bodies of the lower respiratory tracts during the study period. The mean age of the patients was 2.6 years \pm 8.23. Patients were predominantly male with 27 cases (58.70 %), a sex ratio of 1.42. The foreign bodies were of organic type in 82.60% of the cases, against 17.4 % of non organic. The location of foreign bodies was laryngeal in 03 cases (06.52%), tracheal in 06 cases (13.04%) and bronchial in 37 cases (80.43%). The average consultation time was 3.12 days \pm 4.7. The circumstances of discovery were a notion of penetration syndrome in 69.57%, respiratory dyspnea in 91.30%, a queasy cough in 56.52% of cases and a chance discovery in 2.17% of cases. . The foreign bodies were radio-opaque in 17.39% of cases. Extraction of foreign bodies was performed under general anesthesia. In intraoperative operating room, incidents / accidents were noted in 23.91 %. Operative follow-up was simple in 82.60% of cases and complications were recorded in 15.21% of cases.

Conclusion: Foreign bodies of the lower respiratory tracts remain a topical issue for the child. The therapeutic treatment is based on the realization of a Laryngo-tracheo-bronchial endoscopy, under general anesthesia by an experienced crew.

Keywords: Foreign bodies, lower respiratory tracts, anesthesia, Souro Sanou University Hospital Center in Bobo-Dioulasso.

Introduction

Inhalation of a foreign body (FB) is a common cause of respiratory distress in children. It can be responsible for an acute asphyxia chart, which can cause death if extraction maneuvers are not quickly realized [1,2]. Any suspicion of FB inhibition of the lower airways must lead to the completion of a laryngotracheo-bronchial endoscopy in a specialized environment in order to confirm the diagnosis and to allow its extraction [2]. This endoscopy performed under general anesthesia represents a real challenge for the anesthesiologist, who must ensure proper oxygenation and ventilation in a child with mechanical respiration tracts obstruction .

Our study aims to evaluate the anesthetic management of the extraction of FB of the lower respiratory tracts in a context of

limited resources.

Patients and methods

It is a descriptive retrospective study covered, over 3 years from 1st January 2014 to 31st December 2016. It took place in the Resuscitation Service and otolaryngology (ORL) at Souro Sanou University Hospital Center in Bobo-Dioulasso. Were included in the study, all patients admitted to the so-called Service for lower respiratory tracts FB and received anesthesia. Have not been included, those whose medical records were unusable. An investigation sheet has been established for the collection of data. The variables studied were focused on the socio-demographic data (age, gender), clinical aspects (nature and location of the foreign bodies,

circumstances of discovery, clinical signs), paraclinical aspects, the therapeutic management (anesthetic technique, surgical technique) and the future of patients. The data has been processed and analyzed with Epi Info 3.3.2 and Excel 2010.

Results

Epidemiology

Over a period of three years, 46 patients were admitted for foreign bodies of the lower respiratory tracts. The mean age of the patients was 2.6 years \pm 8.23 with extremes of 3 months and 17 years. The dominant age group was [0-3 years old](Table 1). The patients were predominantly male with 27 cases (58.70%), a sex ratio of 1.42.

Table 1 Distribution of patients by age group

Age class (years) percentage (%)	frequency	
[0-3 [	32	69.57
[3-6 [	07	15.22
[6-9 [	04	08.69
[9-12 [	01	02.17
[12-15 [	01	02.17
[15-17 [	01	02.17
Total	46	100

Nature of the foreign body

Foreign bodies were of organic origin in 82.60% of cases, compared to 17.40% of non-organic (Table 2). Peanuts were the most common type with 58, 69%.

Table 2 : Distribution of foreign bodies according to their nature

Nature of foreign body percentage (%)	frequency	
Organic		
Plants :		
Peanuts	27	58.69
Sweet peas	04	08.69
Bean seed	02	04.34
Jujub seed	01	02.17
Date (fruit)	01	02.17
Animals :		
Bone (fish and meat)	03	06,52
Total	38	82.62
Non-organic		
Screw	02	04.34
Thumbtack	01	02.17
Needle	01	02.17
Earring	01	02.17
Whistle	01	02.17
Hood of pen	01	02.17
Metal ball	01	02.17
Total	08	17.39

Location

The location of FB was laryngeal in 03cases (06.52%) tracheal in 06 cases (13.04%) and bronchial in 37cases (80.43%). The right bronchus was the most frequent site (29 cases) in bronchial localization.

Diagnostic

Modes of admission were a reference in 25 cases (54.35%), a transfer from another department of the hospital to the ENT in 16 cases (34.78%) and a direct admission in 5 cases (10.87 %)). The average time of consultation was 3.12 days \pm 4.7 with extremes of 4 hours and 21 days. The majority (37 cases) of patients consulted within 48 hours of the accident (Table 3).

Table 3 Distribution of patients according to consultation time

Time (days)	frequency	percentage (%)
[0-2 [	39	84.78
[2-4 [	03	06.52
[4-6 [	02	04.35
[6 and over	02	04.35
Total	46	100

The discovery circumstances was a concept of penetration syndrome in 69.57%, respiratory dyspnea in 91.30%, a hacking cough in 56.52% of cases and a chance discovery in 2.17 %. Paraclinically the chest radiograph visualized a FB radio-opaque in 17.39% of the cases (3 bones, 2 screws, 1 pin, 1 needle and 1 metal ball).

Therapeutic care

Preoperatively all patients had antibiotic therapy (ceftriaxone for injection) with corticosteroids (methyl prednisolone injection). On the other hand, patients with severe dyspnea (27 cases) were put under oxygen in the mask (3 liters per minute).

Anesthesia

General anesthesia was the block technique for all cases. All patients were seen on a pre-anesthetic visit. It was based on interrogation, clinical examination of the cardiovascular and respiratory apparatus. Clinical evaluation found an acute dyspnea in eight patients. Laboratory tests (hemogram) made preoperatively was without particularity. Arterial gasometry was not available at the hospital. The duration of the preoperative fasting was respected in 38 cases (82.61%). Patients were monitored in the intervention room (heart rate, pulse oximetry, non-invasive blood pressure). Anesthetic induction was preceded by pre-oxygenation to maintain peripheral oxygen saturation (SpO₂) above 90%. After the establishment of the venous route, the premedication was made with atropine (20 μ g/kg) to reduce bronchial secretions. Anesthetic induction was performed with an opioid (fentanyl at a dose of 3 μ g/kg) and an intravenous hypnotic (propofol at a dosage of 3 mg/kg). Anesthesia was maintained by reinjections of propofol. Emergency tracheotomy was performed in seven cases. All patients were kept in

spontaneous ventilation during the FB extraction maneuver. In the event of significant desaturation (SpO₂ less than 90%), the extraction maneuver was interrupted and the patient was ventilated with 100% oxygen, before the surgeon resumed the maneuver. The duration of interventions was less than 30 minutes in the majority of cases (67.40%) (Table4).

Table 4 Average duration of extraction

Duration (minutes) (%)	frequency	percentage
[0-30 [	31	67.40
[30-60 [	11	23.90
60 and over	04	08.70
Total	46	100

Incidents / accidents were noted intraoperatively during the extraction maneuver: cardiorespiratory arrest (4 cases), laryngeal spasm (7cases); that is 23.91% of complications. One death occurred in the operating theater, or 2.17% of cases.

Surgery

Endoscopy was performed using a rigid bronchoscope equipped with a fiber optic light source to which oxygen could be connected. The extraction was made with a foreign body forceps kind " beak of crab " .

Evolution

The postoperative course was simply in 38 cases (82.60%). Postoperative complications were noted in seven cases (15.21%) including five cases (10, 87%) that required admission in Resuscitation service. There was wake up delay in two cases and desaturation in three cases. Two patients were secondarily taken to the operating theater with success after failure of the first attempt of the FB extraction.

Discussion

Epidemiological aspects

Inhalation of FB is a classic cause of household accidents in children [3,4]. The age of predilection in our study and for most adults is before 4 years [3,5,6]. Indeed, for physiological reasons, there is an immaturity of laryngeal reflex per-swallowing in young children [3, 5, 6] In the majority of cases, it's a boy [5, 6, 7, 8].

Nature of the foreign body

In our study, the majority of FB was of organic type (82.60%) and peanuts were the food most in question. Indeed for many authors, the FB are in 50 to 80% of the cases of organic and nutritional nature in children under 3 years old [1, 5, 8]. Inorganic EC are less frequent (17.40% in our study) and would represent only 15% to 20% of cases [1]. They are found in older subjects, occurring most often in a playful or professional context [3].

Location

FB was bronchial localization in most cases and predominant at the level of the right main bronchus. Bronchial location is

the most common in the literature [5] and the right strain bronchus is concerned in 47 to 87% for anatomical reasons [9].

Diagnostic

Clinically, the consultation time was long in our study and the main circumstances of discovery were respiratory dyspnea, a notion of penetration syndrome and a quintessential cough. For most authors the penetration syndrome is constant and must always be sought [10,11]. In this context, cough is the most common symptom for some authors [12,13] . In paraclinical level, in our study the chest radiography found a FB radio-opaque (Figure 1) in 17.39% of cases.

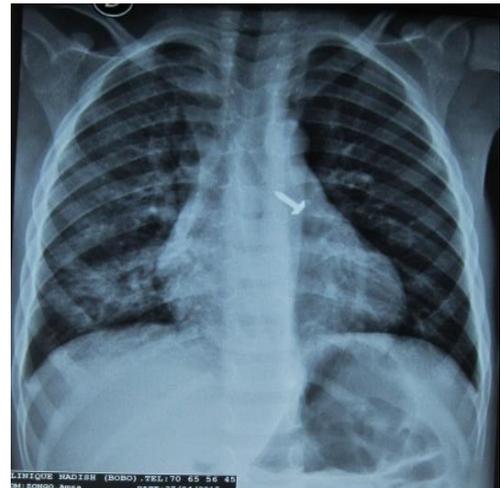


Figure 1 : Radiographic image of a left intra-bronchial FB radio-opaque

Indeed, imagery without delaying the treatment makes it possible to visualize the radio-opaque FB in 6 to 20% of the cases [5,14 ,15] on the one hand and on the other hand makes it possible to evaluate the repercussion of this one on the respiratory tracts and the underlying pulmonary parenchyma [8,10 ,13 ,16 ,17].

Therapeutic care

In our study, the treatment was late (long consultation time); it was medical and surgical. The medical treatment was antibiotic therapy and immediate corticotherapy and oxygen for those with dyspnea. The surgical technique performed was a bronchoscopy with rigid tube under general anesthesia for all patients. For most authors, the use of bronchoscopic broaching with a rigid tube remains the standard technique for the extraction of FB [12,14 ,18 ,19]. It allows the extraction of FB without risk of blockage of it at the level of the trachea or larynx [19]. This rigid tube endoscopy can be enamelled with complications (23.91% in our study). For Fidkowski CW [5], the incidence of these complications is 0.96% and the death rate associated with bronchoscopy is 0 to 0.94%. Mortality was 2.17% in our series. The high frequency of morbidity and mortality in our context is probably related to the long delay of consultation of patients, the insufficiency of the technical platform and the experience of the care teams (surgery and anesthesia) in the care of FB of the respiratory tracts in the

small child.

The anesthetic technique practiced was a general anesthesia in all our patients. For Mani N [20], it is the safest technique to ensure the smooth running of tracheobronchial endoscopy. This is a high-risk anesthesia and the procedure should be practiced by experienced practitioners [10,20, 21, 22, 23]. The sharing of the operative field between anesthesia and surgery teams, in these often difficult areas, is an additional constraint. The major risk is the intraoperative occurrence of hypoxia related to the young age, the duration of endoscopy and the nature of the FB [21]. Preoperative assessment is an important step in the evaluation of anesthetic risk [5,12,23]. Intravenous anesthesia was performed in our study. For some teams, inhalational anesthesia is performed in the absence of full stomach [19,24] and intravenous anesthesia indicated in cases of full stomach with fast-sequence induction [23]. The two techniques are described and used successfully by different teams; they remain above all a matter of experience [14, 19, 22, 25].

Postoperative period

Postoperative follow-up was simple in most cases in our study. However, complications occurred in 15.21% of cases. For Zhang X [26], These are respiratory complications most often and must be treated before any fatal visceral decompensation.

In the literature, the extraction of FB intrabronchial, is accompanied by morbidity included between 1 and 6% and a less than 1% mortality [12 27].

Conclusion

The inhalation of a FB is one of the most common household accidents in children and constitutes a medical emergency. Anesthetic management during rigid bronchoscopy is a high risk period. It must be multidisciplinary by experienced teams on the one hand and other by a close collaboration between the anesthesiologist and surgeon.

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