



## REGIONAL VARIATION AND RESULTS OF THE NATURE OF FOREIGN BODY ASPIRATIONS IN SUBTROPICAL REGION: NYALA EXPERIENCES

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### ARTICLE INFO

#### Article history:

Received: 27 October 2019

Accepted: 12 August 2020

Available Online: 10 September 2020

#### Key Words:

Foreign body aspiration,  
Child,  
Rigid bronchoscopy

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Turkish Journal of Health Science and Life  
2020, Vol.3, No.1, 11-14.

### ABSTRACT

**Aim:** Foreign body aspirations are a serious respiratory illness that can threaten life, particularly in childhood, in the first three years of life. We aimed to compare the qualitative changes and their results of the asphyxiated foreign bodies of the first five-year-old children we encountered in the tropical region with literature.

**Material and Method:** In Nyala Sudan Turkey Education and Research Hospital, 11 patients in the range of 0-5 years between the dates of 04/11/2018 and 05/30/2018 with history of foreign body aspiration was accepted after a physical examination and radiological imaging with a preliminary diagnosis. All patients underwent rigid bronchoscopy under general anesthesia, foreign bodies detected were removed by using alligator forceps with no significant complication.

**Results:** The youngest patient was 9 months old while the oldest was 5 years old and the average age was 2.43. Foreign bodies were removed by rigid bronchoscopy in 5 (45.45%) patients from the right main bronchus, 2 (18.18%) in the left main bronchus and 4 (36.36%) in the trachea. Nine (81.81%) of the extracted foreign bodies were organic (bread, peanut, papaya, grasshopper, mango) and 2 (18.18%) were inorganic (stone, battery).

**Conclusion:** In advanced countries, it is easy to reach parents and raise awareness about the subject, but this is a difficult situation in regions where socioeconomic level is low, communication and economic problems are experienced. Foreign body aspirations may differ in the subtropical belt due to many challenging conditions, but there is no difference in the complications that can be encountered at the end.

## 1. Introduction

Foreign body aspirations are a serious respiratory illness that can threaten life, particularly in childhood, in the first three years of life.<sup>1,2</sup> Sometimes, patients diagnosed with foreign body aspiration can be mistakenly diagnosed with allergic respiratory system diseases by overlooking the diagnosis. Depending on the nature of aspirated foreign body and its localization, age and general medical condition of the patient, it can be confronted with very different symptoms (1,2). If not removed, the foreign body may be discarded with coughing spontaneously, or may lead persisting respiratory infections, granulation tissue formation, bronchiectasis, respiratory arrest by staying in respiratory tract. There is often a typical

anamnesis, equal ventilation of both hemithoraxes and respiratory sounds are often suggestive of localization in physical examination for diagnosis. In radiological imaging (X-ray, thorax CT), useful information can be obtained in terms of both diagnosis and localization, especially in inorganic foreign bodies. Interventions for removal of foreign bodies are very risky initiatives and gold standard application is rigid bronchoscope (1). We aimed to compare the qualitative changes and their results of the asphyxiated foreign bodies of the first five-year-old children we encountered in the tropical region with literature.

## 2. Material and Method

In Nyala Sudan Turkey Education and Research Hospital, 11 patients in the range of 0-5 years between the dates of 04/11/2018 and 05/30/2018 with the history of foreign body aspiration was accepted after a physical examination and radiological imaging with a preliminary diagnosis. All patients underwent rigid bronchoscopy under general anesthesia, foreign bodies detected were removed by using alligator forceps with no significant complication. Neuromuscular blockade with atracurium was achieved when propofol was chosen for induction in general anesthesia. Two patients who developed laryngeal spasm after the procedure were given 3 mg / kg prednisolone intravenously. Nine patients were hospitalized after the procedure at service, two patients were followed up at the intensive care unit with a close follow-up purpose for overnight. The clinical status of the patients was followed in the outpatient clinic after discharge.

## 3. Results

Six of the cases (54.54%) were male and 5 (45.46%) were female. The youngest patient was 9 months old while the oldest was 5 years old and the average age was 2.43. The average referral time to the hospital is 5.27 days. There is a history of foreign body aspiration in every single patient. All of them were symptomatic; cough and wheezing were present in all of our patients (100%), and low tachypnea and oxygen saturation levels were evident in 3 (27.27%) patients. There were 8 (72.72%) pathologic findings on physical examination and 3 (27.27%) patients had no pathological physical examination findings. 7 (63.63%) of the pathological physical examination findings were roncus, 5 (45.45%) of the patients had a difference in ventilation between two hemithoraxes while 2 (18.18%) patients were having stridor. Chest X-ray was performed for all of our patients, 4 (36.36%) patients had thorax CT. 3 (27.27%) patients had direct formation of foreign body in radiological examinations whereas 5

(45.45%) patients had indirect findings and 3 (27.27%) patients had no pathologic formations. 3 (60%) of the indirect radiological findings were atelectasis while 2 (40%) were hyperaeration. Foreign bodies were removed by rigid bronchoscopy in 5 (45.45%) patients from the right main bronchus, 2 (18.18%) in the left main bronchus and 4 (36.36%) in the trachea. (Figure 1) Nine (81,81%) of the extracted foreign bodies were organic (bread, peanut, papaya, grasshopper, mango) and 2 (18,18%) were inorganic (stone, battery) (Figure 2).

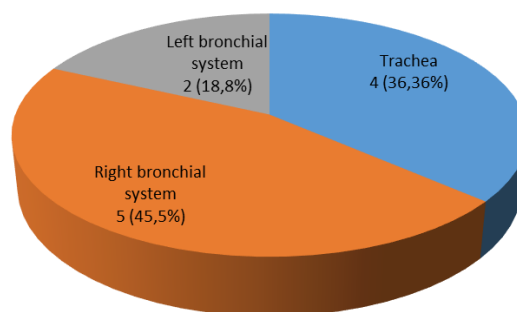


Figure 1. Localization of foreign bodies

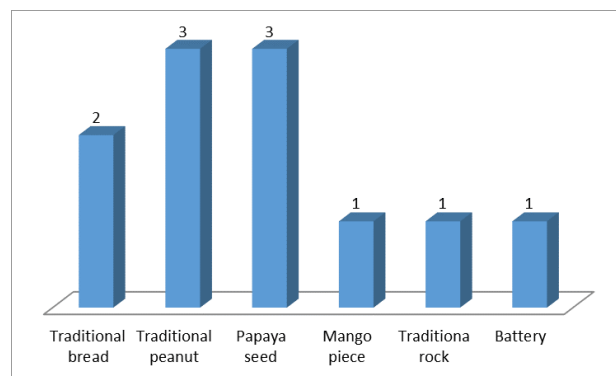


Figure 2: Foreign bodies

Post-procedural laryngospasm occurred in 2 (18.18%) of the patients and no other postoperative complications were seen. No advanced surgical intervention was required after rigid bronchoscopy and there was no mortality. No patient had developed granulation tissue due to long-term exposure to foreign body aspiration in the bronchial system. 2 (18.18%) patients had a history of lower respiratory tract infections lasting longer than 1 week due to foreign body aspiration. The clinical

findings of the whole were improved and all of the patients came to be discharged after the first day. There were no patients who needed rigid bronchoscopy again.

#### 4. Discussion

Although they are seen in adults, foreign body aspirations are often seen in children younger than 3 years (1,2). The most widely accepted view is that the impulse of recognition by receiving the object in their mouth in this age of those children, will increase the risk of aspiration (3). While the average age of our patients was 2.43, 6 (54.54%) were male and 5 (45.46%) were female.

The duration of admission to the hospital in foreign body aspirations is often the first 6- 24 hours (1,2). This time period was 5.27 days, which was well above the literature. Many patients can be followed up as allergic respiratory disease, accidentally. Usually, there is a typical story given by parents; as the respiratory tract is narrower in children, resulting in more reactions in the larynx and trachea during aspiration of foreign bodies, sudden coughing and bruising may appear and as the object progresses, these complaints diminish. In the early period after aspiration, the clinical presentation of patients shows varying degrees such as, asymptomatic state to respiratory arrest (1,2). In a study on baby autopsies performed in Turkey, the most common cause of death was anoxia and the second most common cause of anoxynia was foreign body aspirations (4). But, there is no reliable data is available for Sudan. Early dyspnea, wheezing are the most common symptoms. Stridor, hoarseness, increased respiratory effort can be observed. All of the patients who applied to our unit were symptomatic but the most common symptom was dyspnea and wheezing, consistent with the literature, 3 (27.27%) patients had low oxygen saturation and tachycardia. In the late phase of foreign body aspirations, persistant respiratory infections, granulation tissue formation, bronchiectasis can be seen (1) 5 (45.45%) of our patients had a history of

foreign body aspiration for over one week and even 2 (18.18%) had foreign body histories for two weeks, although there was no granulation tissue in the bronchial system during bronchoscopy. 2 (18.18%) patients had a history of lower respiratory tract infections lasting longer than 1 week due to foreign body aspiration.

PA chest X-ray, thoracic CT can be used as radiological imaging for diagnostic purposes. Direct foreign bodies can be seen in these examinations, as well as indirect findings such as air trapping, mediastinal shift, and emphysema (5,6,7). PA chest X-ray was requested from all of our patients, thorax CT was applied to 4 patients. Although foreign body was directly seen in 3 (27.27%) of the patients, 5 (45.45%) had indirect findings and 3 (27.27%) had no pathological appearance.

In large studies, the location where foreign bodies are detected is the right main bronchus, then left main bronchus and trachea will follow (5,8,9). In the young age group, the anatomic angulation in the right main bronchus is not yet fully developed, because of that there are studies showing that there is not a high difference in the distribution of foreign body aspirations between the right and left main bronchi (1) In our study, localization of foreign bodies was as follows; 5 (50%) in right main bronchus, 2 (20%) in left main bronchus and 4 (36,36%) in trachea were detected.

For today, the most accepted treatment modality is rigid bronchoscopy and applying conservative or surgical treatment options for further possible complications (1). Main complications that may be encountered are laryngeal edema, asphyxia, cardiac arrest. Foreign bodies were totally removed with rigid bronchoscopy in all of our patients and 2 (18.18%) patients had no postoperative complications except early postoperative bronchospasm. No advanced surgical intervention was required after rigid bronchoscopy and no mortality was seen. On the day following of the procedure, all patients were discharged and the clinical progress of all patients were improved at follow-ups.

The most common foreign bodies in childhood age group in Turkey are organic foreign bodies such as hazelnut peanuts, dry beans, seeds, nutshells depending on eating habits (1,2,10). Climate change due to geography, socio-economic structure, culture-dependent child care characteristics make significant changes in feeding habits. In our study, we have encountered foreign body aspirations such as regional bread type, local peanut type, papaya kernel, locust, mango, stone, battery, etc., which can be reached by the local low income group depending on the social realities of the region, childcare information and economic situation. Due to difficulties in all cases such as economic difficulties, indifference, bizarre beliefs, lack of health center and distance to reach health center, the period of application to the hospital was delayed.

## 5. Conclusion

Foreign body aspiration is a condition that can occur frequently in childhood and can lead to serious complications. In advanced countries, it is easy to reach parents and raise awareness about the subject, but this is a difficult situation in regions where socioeconomic level is low, communication and economical problems are experienced. Foreign body aspirations may differ in the subtropic belt due to many challenging conditions, but there is no difference in the complications that can be encountered at the end. We have concluded that the way to reduce the frequency of foreign body aspiration in children and to reduce the most complications that may occur is through educating and raising awareness in this area above all else.

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