

# Management of Traumatic Foreign Bodies of the Upper Aerodigestive Tract in Children with Limited Diagnostic Resources at the Pediatric University Hospital of Central African Republic of Bangui

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## Abstract

Accidental acute upper airway obstruction (UAO) is a common situation in pediatric emergencies. It is a source of morbidity and even mortality, particularly in children under 3 years of age. We report a clinical case of traumatic foreign body injury to the upper aerodigestive tract in a 7-year-old girl following a play accident.

## Keywords

Foreign Bodies, Trauma, Child, Bangui

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## 1. Introduction

External trauma to the upper airways (larynx, trachea, oesophagus), whether open or closed, is rare and can cause formidable problems in the emergency department, due to the wide variety of clinical pictures produced, which are sometimes falsely reassuring, as they may decompensate secondarily [1] [2] [3]. The complexity of potential clinical pictures is largely explained by the multiplicity of anatomical elements that cross the cervical region and may be at the origin of associated lesions [4]. The circumstance of occurrence, the absence of a penetration syndrome on questioning, the location of the traumatic foreign body, the age,

sex and geographical location of the patient have led to emergency management. We report a clinical case of a traumatic foreign body of the upper aerodigestive tract that occurred after a play accident in a 7-year-old girl, whose case was managed in a context of difficult diagnosis.

## 2. Observation

This was a 7-year-old female child weighing 19 kg, a student with no particular pathological history, up-to-date vaccinations and a low socio-demographic standard of living, who was referred to us from a regional hospital 120 km from the capital, for treatment of a cervical wound caused by a penetrating object. On arrival, the child was found to be conscious, with a clean, dry bandage around the neck, enclosing a steel rod. Conjunctival staining and hemodynamic constants were stable. There was no respiratory distress, the pulmonary, cardiac and digestive systems were normal, and there was no dysphonia. However, there was odynophagia accompanied by a swallowing disorder marked by hypersalivation, and pharyngeal and tracheobronchial congestion. There was no cough or hemoptysis (bloody sputum). The oropharynx was unremarkable. Hypopharyngoscopy revealed blood clots and a transverse steel foreign body that could not be removed directly. As soon as we received the patient, we immediately called the pediatric intensive care unit, the Ent department and the head and neck surgery department, and took the child to the ENT department. Once the dressing had been removed, we saw a steel iron rod some 50 cm long frozen in the neck, with a portal of entry located in the upper left lateral third, the tip of which threatened under the right horizontal ramus of the mandible with an oblique upward trajectory. X-rays and cervical CT scans were not performed, due to a lack of operational service. We opted for a safer cervicotomy to remove the foreign body.

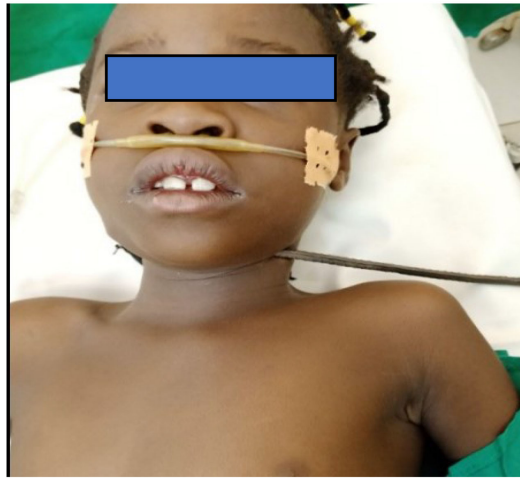
With the patient under general anaesthetic, head immobilized and neck in extension, we make a slightly oblique incision upwards (following the CE) from the portal of entry, detaching the subcutaneous planes, opening the posterior part of the mylohyoid, opening the hypothyroid membrane for around 5 cm, and exposing the foreign body, which we gently remove. Exploration revealed no vascular lesions or communication with the hypopharynx. Meticulous cleansing followed by a 3-plane closure was performed. The child was treated medically with VAT 750 IU subcutaneous anti-tetanus serotherapy, dexamethasone 4 mg 1 mg/kg/day every 8 h and antibiotics Ampicillin 1 g, 200 mg/kg/day every 6 h, Gentalline 80 mg, 5 mg/kg/day, paracetamol 1 g, 60 mg/kg/day every 6 h. On postoperative day 1, the dressing was clean, hemodynamic constants normal, and there was no respiratory distress, dysphonia or dysphagia. At 3 days post-op, the evolution was favorable and the patient was discharged.

## 3. Discussion

Trauma to the external, open upper airways is serious not only because of the

immediate vital risk, but also because of the risk of distant functional sequelae [1] [5]. A thorough understanding of the mechanisms of injury, the warning signs and a good knowledge of the major cervical areas are essential to avoid misdiagnosing the trauma [6] [7] [8]. Our patient received a foreign body in the form of a steel bar on the anterior aspect of her neck. Her condition can be explained by violence during children's games in a rural environment, due to a lack of supervision on the part of the parents. Asphyxia is the leading cause of death in both closed and open laryngeal trauma. Ensuring permeability of the respiratory tract should be the first step. Management of external trauma to the larynx is based on clinical examination, with nasofibroscopy cervical CT Scan and endoscopy helping to establish a diagnosis of severity and guide treatment. The multidisciplinary team decided to take rapid action, given the limited space available, the emergency situation and the anxieties of the parents. A foreign body in a child's airways is a paediatric emergency, and one of the most frequent accidents. There are 1500 cases in France every year. In developing countries, the frequency is underestimated [9] [10] [11]. Most authors report that this accident occurs at the age of grasping, from 6 months to 3 years, with a peak around 4 years, and is predominantly male [12] [13] [14]. Our particular case involved a 7-year-old female child who, while playing with her friends, was hit in the neck by a projected steel bar. We note that foreign bodies often occur as a result of a daytime accident in a healthy child at a specific time (during a meal or a game). In 80% of cases, questioning reveals the notion of a penetration syndrome, reflecting a reflex to protect the respiratory tract. This syndrome includes vocal cord closure, laryngeal spasm, resulting in a hacking cough after a sudden attack of suffocation with cyanosis followed by dyspnea, cardiovascular and neurological signs [15] [16]. Our patient did not present with penetration syndrome or vocal cord closure, which could be explained by the particular location of the foreign body (**Figure 1** and **Figure 2**). The presence of a foreign body in the respiratory tract leads to a false route, dyspnoea with signs of struggle, oedema and infection. An edema 0.5 cm in diameter is enough to reduce the subglottic airway by 75% [17] [18]. The nature of the foreign body varies according to the environment and eating habits. It may be organic or inorganic (fish bones, pearls, peanuts, metal, etc.) [19]. Our patient presents with a rigid metallic body made of steel. The clinical symptomatology depends on the location of the foreign body (**Table 1**). The examination should be brief, auscultation for bronchial rales, paraclinical radiography of the neck and lungs face and profile, blood gases and a standard work-up for endoscopy: CBC, GS/RH, TP, TCK; should be carried out within a short time, which was not done in our patient for lack of means, as the parents had a low socio-demographic level. Treatment was aimed at extracting the foreign body, to be prevented by informing the parents of the seriousness of the accident, and using visible and radio-opaque toys [20] [21].

Medical treatment consists of fast-acting corticosteroids (1 to 2 mg) and prophylactic antibiotics. Depending on the location of the foreign body and the delay before the incident, certain maneuvers can be performed, such as the



**Figure 1.** The road of external trauma to the body [CHUPB].



**Figure 2.** Upper aerial cervical vertebra [CHUPB].

**Table 1.** Clinical symptoms depend on the location of the foreign body. Clinical manifestations of Larynx in foreign body localization.

The location of foreign bodies	Clinical demonstration
<b>Larynx</b>	Inspiration obstacle Dysphonie Decorate Stridor Invalid and repeated dry Tok Apnea
<b>betray</b>	Two developmental disorders About Wheezing Query on the change of position Apnea
<b>Bronche</b>	About Wheezing Decorate Toux Claws that shake or tremble unilaterally

HEIMLICH maneuver. Hyperpressure in the abdomen enables the foreign body to be expelled. In the MOFFENSON maneuver, the young child is placed on the operator's knee; a flat hand is vigorously applied to the back to expel the foreign body [22]. In our case, none of these manoeuvres was performed, due to the location of the foreign body. Rigid tube laryngotracheobronchoscopy (endoscopy) under general anaesthesia and rigid fibroscopy allow identification of the foreign body. The gold standard of treatment is rigid-tube tracheobronchoscopy under general anaesthetic, to confirm the presence of a foreign body and extract it [23]. The indications for treatment will depend on the environment, the consultation time, the nature of the foreign body and its location. Our patient came from far away, and multidisciplinary management was beneficial. Monitoring was based on elements of severity: age, fever leading to superinfection, ineffectiveness of treatment. The evolution of the disease depends on the delay in diagnosis, the size or shape of the foreign body, the migration of the foreign body into the trachea or bronchus, and the possibility of expulsion of the foreign body.

#### 4. Conclusion

Foreign bodies are a frequent emergency, posing a diagnostic problem if the accident is unrecognized, and treatment is difficult because the equipment is poorly adapted. Multidisciplinary management in a context where diagnosis is difficult can help avoid complications. The best treatment remains prevention, which involves monitoring children.

#### Conflicts of Interest

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

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