

# Journal of Pediatric Sciences

## Aspiration of a Castor Oil Seed masquerading as Laryngeal Diphtheria in an Infant

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Journal of Pediatric Sciences 2011;3(2):e76

How to cite this article:

Basu S, Kumar A, Bagri N, Das BK. Aspiration of a Castor Oil Seed masquerading as Laryngeal Diphtheria in an Infant . Journal of Pediatric Sciences. 2011;3(2):e76

## CASE REPORT

## Aspiration of a Castor Oil Seed masquerading as Laryngeal Diphtheria in an Infant

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### Abstract:

Foreign body aspiration in children often remains undetected because of misleading clinical findings. Young age and absence of the history of an aspiration episode may lead to a delayed diagnosis. A 6-month-old unimmunized boy presented with sudden onset low grade fever, aphonia and respiratory distress for 7 days. He was clinically diagnosed as a case of diphtheria and was treated accordingly. X-ray of neck and chest were normal. Direct laryngoscopy showed a brownish white membrane completely covering the vocal cords along with small punctate bleeding spots in the surrounding laryngeal wall. Thinking of a possibility of laryngeal diphtheria vs. any mass lesion in vocal cord he was posted for laryngoscopic examination under general anesthesia but before the procedure, he coughed out an oval shaped brownish white mass which was actually a thorny seed of castor oil. Though high incidence of diphtheria in the community, absence of a history of immunization and aspiration of a foreign body, radiolucent nature of the seed and young age of the patient favored the diagnosis of diphtheria, a high level of suspicion and constant vigil over clinical progress is necessary for the physician to prevent delayed diagnosis and subsequent complications.

**Keywords:** Aspiration, Castor Oil Seed, Laryngeal Diphtheria, Infant

**Received:** 12/01/2011; **Accepted:** 10/03/2011

### Introduction

Upper airway obstructive disorders (UAOD) in children are either congenital or acquired. The presentation and management of these disorders are significantly influenced both by the anatomic location of the obstruction and its severity. Tracheobronchial foreign body (TFB) aspiration is a common acquired cause UAOD in children, with sequelae ranging from choking and fatal asphyxiation to chronic and recurrent chest infections. Young infants are at risk for foreign body aspiration because of their tendency to put everything in their mouths, narrow airways and immature protective mechanisms [1]. The diagnosis of a TFB might be missed and delayed, especially where parents do not recall a history of acute choking/coughing or has not witnessed an aspiration episode. Undiagnosed, retained TFBs may cause serious complications such as airway obstruction, pneumonia or atelectasis [2]. Development of inflammation and granulation tissue around the TFB in delayed cases make the diagnosis more difficult, and it is not uncommon for patients to be treated for other disorders. A high level of

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suspicion and constant vigil over clinical progress is necessary for the physician to prevent delayed

diagnosis and subsequent complications. We report a laryngeal foreign body aspiration in a 6-month-old child who was treated as a case of diphtheria for 10 days till he coughed out a thorny seed of castor oil.

### Case Report

A 6-month-old boy presented with sudden onset low grade fever, aphonia and respiratory distress for 7 days. The infant was exclusively breastfed for first 2 months and was receiving cow's milk supplementation for last 4 months. There was no history of intake of any solid food. He was completely unimmunized since birth. The family was from a poor socio-economic background; both the parents were manual laborer by occupation. The infant was looked after by two elder siblings, aged 6 years and 2 years respectively. He was shown to a local private hospital 3 days after the onset of the disease, where he was diagnosed clinically as a case of laryngeal diphtheria and was managed with oxygen, intravenous (IV) fluids, IV crystalline penicillin and intramuscular anti-diphtheria immunoglobulin. He did not show any improvement in next 4 days and was referred to us. On examination, the child was aphonic with respiratory distress in the form of tachypnea (respiratory rate 54/minute) and marked subcostal and intercostal retractions. Auscultation of chest revealed poor but equal bilateral air entry. Rest of the vitals and systemic examinations were within normal limits. He was hungry with strong sucking efforts but attempt to breastfeeding increased respiratory distress. Examination of throat was normal, no membrane was seen over tonsillar fossae and pharyngeal walls. X-rays of neck and chest were normal. Direct laryngoscopy showed a brownish white membrane completely covering the vocal cords and small punctate bleeding spots were seen in the surrounding laryngeal wall. A possibility of laryngeal diphtheria vs. any mass lesion arising from the vocal cord was kept. Since the infant was struggling during laryngoscopy making the respiratory distress worse, any further examination was abandoned and he was scheduled for laryngoscopic examination under general anesthesia in the next morning. Soon after the procedure, during an effort of vigorous cry, the infant coughed out an oval shaped brownish white mass. On a closer look, it was a thorny seed of size 2 cm x 1 cm x 1 cm, fully covered with mucus (Figure 1) and was identified to be a seed of castor oil plant (*Ricinus*

*communis*). Repeat direct laryngoscopy on the next morning showed edematous vocal cords with multiple bleeding spots. Blood culture and throat swab culture sent earlier were sterile. The infant's condition gradually improved on supportive management, respiratory distress subsided and voice became normal. The family was sent to the hospital social worker for necessary counseling and help. Later on, the eldest sibling admitted that while playing with the castor oil seeds they put one such seed in the mouth of the youngest one. They did not volunteer this information before as they were scared of the parents.



**Figure 1. Aspirated thorny seed of castor oil covered with mucus**

### Discussion

Common causes of congenital UAOD in children include laryngomalacia, vocal cord paralysis, laryngeal web, subglottic stenosis, vascular compression, congenital tracheal anomaly, complete tracheal rings, and laryngeal cleft. These disorders usually present in the neonatal period and are progressive in nature, which differentiate them from acquired causes of UAOD. Acquired acute UAODs in children are mostly secondary to infections, foreign bodies, trauma, or allergy. The most common infectious cause of UAOD in a developing country is diphtheria. Other causes include peritonsillar, parapharyngeal, or retropharyngeal abscesses,

epiglottitis, viral or bacterial croup and bacterial tracheitis [3].

Radiologic examinations, in conjunction with the history and physical examination are helpful in evaluating the degree of upper airway obstruction, localizing the anatomic point of obstruction, and determining whether the obstruction is due to an infection or foreign body. Plain neck radiographs are helpful in diagnosing retropharyngeal abscesses, epiglottitis, croup and foreign body aspiration. Lateral neck films of retropharyngeal abscesses demonstrate increased soft tissue depth in the prevertebral space along with an inversion of the normal lordosis of the cervical spine. Radiograph of a patient with epiglottitis shows a swollen epiglottis encroaching on the airway, a finding often called the “thumb sign”. The classic “steeple sign” of subglottic narrowing, with a variably dilated hypopharynx, may be observed in viral croup. Direct laryngoscopy rarely is necessary to diagnose or treat airway obstructions. However, intubations requiring direct fiberoptic bronchoscopy may be necessary in epiglottitis and bacterial tracheitis. While managing UAOD, recognition of impending airway obstruction is important because cardiopulmonary arrest is rarely a sudden event in children, rather it follows a progressive deterioration in respiratory function. Partial obstruction can cause increased work of breathing, progressing to fatigue and respiratory failure, or can evolve into a complete obstruction [3].

Age of the patient is one of the significant criteria in diagnosis of TFB. Most cases occur within first 3 years of life [4,5]. It is rare in infants, though Brkić *et al* in their study of 662 cases found an incidence of 13.7% in infants [5]. Early diagnosis is essential as TFB aspiration can be a life-threatening emergency. If an aspirated solid or semisolid object lodge in the larynx or trachea and is large enough to cause nearly complete obstruction of the airway, asphyxia may rapidly cause death. Lesser degrees of obstruction or passage of the obstructive object beyond the carina may result in less severe signs and symptoms. Mortality is higher in younger age group. In one series, 78% of those who died after TFB aspiration were between 2 months and 4 years of age [6].

The most commonly aspirated foreign bodies in children are organic materials, mostly food products such as peanuts, seeds, and hard candies. Other

objects include bone fragments, nails, small toys, coins, pins etc [7]. Vegetable proteins tend to cause an inflammatory reaction within the airway, leading to edema and granulation tissue at the site of the foreign body which may contribute to airway obstruction while making identification and removal of the object more difficult. The airway becomes more likely to bleed with manipulation; the object is more likely to be obscured and becomes more difficult to dislodge [5]. Radio-opacity of TFBs prevents misinterpretation of the symptoms and provides an early and accurate diagnosis. In children younger than 3 years, 80% of TFBs are found to be radiolucent items [8].

Diphtheria is a fairly common disease in India with case fatality rate varying from 12-16% [9,10]. Common signs and symptoms include low grade fever, sore throat, upper airway obstruction, hoarseness, stridor, bull neck (cervical lymphadenopathy), toxemia and tachycardia. Pseudomembrane, found in 100% patients, is commonly located on the tonsils (71%), pharynx (22%), larynx (9.6%), and uvula (6%) [11,12]. Common complications of diphtheria include laryngeal obstruction, myocarditis, shock, polyneuritis and renal failure [12,13]. Most common airway complication is airway compromise which is seen in almost 70% cases of diphtheria and it is one of the most common cause of early death.<sup>13</sup> Though diphtheria is a rare disease in developed countries, occasional outbreaks have been reported, especially in poor, migrant population [14,15].

In the present case, the diagnosis was made empirically on clinical basis. The first differential diagnosis came to the physician's mind was diphtheria as it is a fairly common disease in India with high case fatality rate. Presence of common signs and symptoms of diphtheria including fever, sore throat, upper airway obstruction, aphonia, and above all lack of immunization, lead to the diagnosis. Possibility of TFB aspiration was remote considering the young age of the patient, absence of a history of aspiration and normal radiograph. Constant irritation of the laryngeal mucus membrane produced a mucus coating over the thorny seed making it look like a whitish brown mass obscuring the laryngeal opening masquerading as laryngeal diphtheria. The nature of the foreign body was unique in this case and has never been reported before. The seed was easily

available to the children as castor oil plants grow wild in this part of the country. This case taught us a lesson that even in unusual situations a high level of suspicion and constant vigil over clinical progress is necessary to prevent delayed diagnosis and subsequent complications.

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