Case Report

Foreign body (disk battery) in the oesophagus mimicking respiratory problem in a 13 months old baby-delayed diagnosis

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Foreign Bodies (FB) in the Aerodigestive tract are a medical emergency often seen in the extremes of age groups particularly in children. Occasionally, diagnosis is delayed because a history of the initial phase in children is missed and the child presents in the asymptomatic phase known to last hours to weeks. The aim of this paper is to present a case of delayed diagnosis of Disk battery in the esophagus mimicking respiratory problem in a 13 month baby. A review of relevant literature is also done. The diagnostic relevance of careful history taking, examination and simple plain radiograph of the neck and chest in a previously well child with respiratory symptoms refractory to medical treatment but consistent with airway obstruction is highlighted.

Keywords: Oesophageal Foreign Bodies, Disk Battery, Delayed Diagnosis

INTRODUCTION

The oesophagus is a fibromuscular tube without a serosa coat in its entire length. It extends from the cricopharyngeus to the cardia of the stomach measuring about 25 cm in the adult. The oesophagus is a direct posterior relation of the laryngotracheobronchial airway for most of its length. It serves the function of involuntary transportation of swallowed food into the stomach. It has 4 anatomical constrictions which in concert with the size, shape and consistency of the foreign body predispose to the lodgment of foreign bodies.

Aspirated foreign bodies can settle in the Larynx, Trachea or Bronchus with 80-90 % lodging in the bronchus. In adults, larger aspirated objects lodge in the larynx or trachea and smaller objects in the right bronchus. In children, the frequency of smaller objects is equal in both bronchi (Murray, 2009).

The Extremes of age groups, most commonly the 1-3 pediatric age groups, are more susceptible to accidental swallow or aspiration of FB. The pediatric group lack molars for grinding food, run and play with food or objects in the mouth, and lack coordination of swallowing and glottis closure (Murray, 2009). Infants and very young children tend to explore their world by taste. The elderly are susceptible as they become edentulous and wear ill-fitting dentures.

Types of FB encountered vary considerably from dentures, meat bolus and bones in adults to coins, fish bone, metallic or plastic toy parts or any object small enough to enter the mouth in children.

The majority of swallowed FB passes harmlessly and spontaneously through the gastrointestinal tract (Lin et al., 2007). About 70 % of oesophageal objects lodge in the upper and mid oesophagus (LOUIE et al., 2009) the cricopharyngeus being the commonest site (Cerri et al., 2003; Macpherson et al.,1996). Risk of injury from ingested FB depends upon its size, shape and consistency (Kenna et al., 1988; Wolach, 1994). Recovery after removal is slower with organic FB than with plastic or metal object because organic objects cause greater inflammatory reaction. Of all dangerous oesophageal FB, disk battery is the most dangerous. The mechanisms of disk battery injury include; direct corrosive action due to leakage, low voltage burns, toxic
absorption of substances, and pressure necrosis (Temple et al., 1983; Samad et al., 1999; Bass et al., 1992). Liquefaction necrosis and perforation has been reported 4-6 hours after ingestion and lodging of disk battery in the oesophagus (Litovitz et al., 1984; Shabino et al., 1979; Maves et al., 1984). Therefore, delayed diagnosis or removal predisposes the child to serious complications. As at 1983, there were only 8 reported cases of disk battery ingestion in the literature. The frequency has risen to 10 per million per year with serious injuries in 1 per 1000 ingestions (Cowan et al., 2002). We present our first case of disk battery impaction in the oesophagus in order to raise awareness of its possibility and potential dangers of delay or misdiagnosis to children in our region.

**CASE REPORT**

A 13 month old female baby presented to our ORL outpatient clinic, University of Calabar Teaching Hospital, Calabar, Nigeria with a 7 week history of barking cough, wheezing and noisy breathing. There was no history of witnessed or suspected foreign body ingestion or aspiration from the mother who was the sole caregiver. The cough was of sudden onset and usually precipitated by feeding and worse in the lying position. The noisy breathing which started 4 days after onset of coughing was associated with wheezing and mild difficulty in breathing which worsen during sleep. There was no history of voice changes, fever or regurgitation of feeds (breast milk and Semisolid cereals). The child rejected attempts at introduction to solid bolus meals during this period.

The baby was misdiagnosed by the Family physician, and receiving medical treatment for bronchial asthma without significant improvement of symptoms.

On physical examination, the baby was healthy looking, but had mild biphasic Stridor and transmitted bronchial breath sounds in all lung fields.

We made a clinical diagnosis of mild upper airway obstruction secondary to foreign body aspiration probably lodged in the trachea.

A plain radiograph of Neck and Chest (AP-View) showed a highly radio opaque circular object of about 20mm in diameter in the upper chest. The tracheobronchial airway was of adequate patency but deviated to the right. There was no mediastinal shift. Figure 1.

Patient was admitted into the hospital for emergency endoscopic evaluation under general anesthesia. Panendoscopy, a combined rigid and flexible esophagoscopy, using a flexible nasendoscope introduced via the lumen of the rigid oesophagoscopy, revealed a metallic disk battery impacted in the mid-oesophagus, 12cm from the upper incisor tooth. The battery was partially embedded in granulation tissue. The FB was removed with minimal bleeding without additional mucosal injury. There was no apparent tracheo-oesophageal fistula on close flexible endoscopic inspection of impaction site. Flexible bronchoscopy was also done to exclude airway foreign body. A nasogastric tube was passed and left insitu for 72 hours. Post-operative management was uneventful. Patient was discharged home on the 5th day post-FB removal to continue follow up in the outpatient clinic.

**DISCUSSION**

Foreign Bodies in the aerodigestive tract are a medical emergency and challenge to the otolaryngologist. They are potentially life threatening conditions causing about 3000 deaths every year despite improved medical care and public awareness (Ozguner et al., 2004).

Presentation depends on the type, size of foreign Body, site of lodging, degree of obstruction as well as duration between ingestion or aspiration and presentation (Koempel et al., 1997).

Oesophageal foreign body may be asymptomatic or characterized by gargling, dysphagia, regurgitation of recent meals, drooling of saliva. There may be dysphonia or respiratory distress due to laryngeal or tracheobronchial compression (Athanassiadi et al., 2002)

Characteristic symptoms usually consist of airway obstruction and hoarseness or aphonia for the larynx, airway obstruction without hoarseness or aphonia for the trachea and cough, unilateral wheezing and reduced breath sounds for the bronchus.

Clinical diagnosis of FB in the aerodigestive tract can be easy and straightforward but however, accurate diagnosis may elude even the very experienced physician (Ozguner et al., 2004).

The most sensitive of diagnostic factors is the eye witness account of caregiver. When this is unavailable, the history of the initial phase of choking and gasping, coughing or airway obstruction in FB aspiration or retching in oesophageal impaction, may be missing (Okafor, 1995). The child may then present in the asymptomatic phase usually lasting hours to weeks thus mimicking respiratory problems.

Our index patient had a disk battery in the esophagus mimicking a respiratory problem to the Family Physician, and to the otolaryngologist a FB in the trachea. A 13 month old baby, still breast feeding and rejecting introduction to solid bolus meals in preference to only breast milk and semisolid diet is not uncommon in our society. Therefore, the mother and family physician may see no cause for suspicion of FB ingestion and lodging. However, notwithstanding a negative history of FB ingestion or aspiration, the presence of mild biphasic stridor, clear voice, bilateral transmitted tracheal breath sounds are sufficient for a clinical suspicion of Aerodigestive FB.

A soft tissue neck X-Ray –PA view revealed a highly radio-opaque FB located 12 cm from upper incisor at endoscopy and partially embedded in granulation tissue.
These findings explained the clinical presentation of our patient. Firstly, the oesophagus and tracheobronchial tree are direct anatomical relations, the later being anterior. Therefore, extrinsic compression of the trachea by esophageal FB may cause airway obstruction mimicking FB in the airway or respiratory problem such as asthma. Partial oesophageal obstruction may cause pooling of secretion and food resulting in regurgitation and aspiration especially in the supine position when patient is asleep. Chronic aspiration may cause laryngitis, tracheobronchitis with wheezes mimicking asthma. Leakage from disk battery may cause chemical tracheoesophagitis, with edema of respiratory mucosa and partial airway obstruction producing noisy difficult breathing. Chemical tracheoesophagitis or ischemia from local pressure may result in tracheoesophageal fistula and its attendant respiratory complications.

The presence of FB and Granulation tissue may cause dysphagia to solid bolus meals hence rejection of introduction to solid meals.

Our patient mimicked a lower respiratory tract problem, presenting a dilemma to the family physician. So we must always remember that “that entire wheeze is not asthma” if delayed diagnosis and referral is to be avoided. Simple plain radiographs of the chest and neck are not adequate in identifying clinically suspected foreign bodies in the aerodigestive tract. Its specificity in radiolucent foreign bodies are low (Nworgu et al., 2004) thus presenting a diagnostic challenge (Bloom et al., 2005; Svedstrom et al., 1989). Inspiratory chest and lateral neck x-ray films usually appear normal in radiolucent airway foreign bodies (Griffith et al., 1984) while diagnosis in the esophagus depends on air entrapment and increased prevertebral soft tissue shadow. However, the delayed diagnosis and referral of our index patient, highlights the
inexcusability and cost effectiveness of simple plain chest and neck radiographs as a diagnostic tool in the management of respiratory problems. Therefore simple plain chest and neck radiographs must never be regarded as constituting additional financial burden on the patient. Bloom et al (2005)

Prevention of morbidity and mortality in young children depend on early diagnosis and endoscopic removal and follow up management. With a careful clinical history and physical examination appropriate radiograph and endoscopic evaluation diagnosis may be hard but not missed. Takada et al (2000)

Delayed diagnosis and referral often leads to the complications phase of aerodigestive foreign bodies with consequent severe morbidity and mortality. Murray (2009)

These may include pneumonia, atelectasis in bronchial obstruction, pneumothorax and pneumomediastinum from airway tear, bleeding from granulation tissue or erosion into a major vessel. Others include obstruction, granulation tissue, paraesophageal abscess and tracheoesophageal fistula in esophageal foreign bodies etc. Oesophageal burns and perforation has been recorded in as early as 4 and 6 hours following ingestion and lodgment of data batteries Ozguner etal (2004)

In conclusion, FB in the Aerodigestive tract could be both a diagnostic and management challenge. A careful history physical examination and chest and neck radiograph are invaluable and inexcusable in the diagnosis of respiratory problems in very young children. Ibekwe et al (1999)

FB in the oesophagus may mimic FB in the airway or respiratory problem. Early recognition and treatment is imperative because the complications are serious and can be life-threatening. Radiology plays an important role in the initial diagnosis, in recognition of complications, and in treatment. Macpherson et al (1996)

Early diagnosis or referral to the otorhinolaryngologist for prompt diagnostic and therapeutic endoscopy is advocated.

REFERENCES


