Subcutaneous emphysema: A least common presentation of foreign body bronchus

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Abstract

Foreign bodies in air way are common days occurrence in Otolaryngologic practice but widespread subcutaneous emphysema extending from scalp to scrotum is a rare entity in foreign body bronchus. As rarity is, a novelty hence reported.

Keywords Massive subcutaneous emphysema · Foreign body · Bronchus · Groundnut.

Introduction

Foreign bodies in the air passages are challenging clinical problems among E.N.T. emergencies. In spite of recent advances in anesthesia and instrumentation, removal of a foreign body bronchus is not easy task and demands skill & expertise on the part of surgeon.

Foreign body aspiration is a phenomenon commonly seen in infants and young children. Gulati SP et al [1] reported that in Northern India groundnut is most common foreign body of tracheobronchial tree in children particularly in winter months of October to January.

Sometime aspirations into the distal airways are silent; they can lead to prolonged entrapment of foreign materials leading to significant complications like surgical emphysema. Those complications can lead to misdiagnosis and mismanagement if there is no index of suspicious of foreign body bronchus. The chest radiographic findings are inadequate to exclude the diagnosis so computed tomography is more accurate for detecting lung parenchymal manifestations of foreign body aspiration. Herein, we are reporting a case of gross subcutaneous emphysema of neck and chest, secondary to foreign body (groundnut piece) in right bronchus.

Case Report

A 15-months-old male child was admitted in pediatric ward, GMCH, Nagpur. Patient's parents gave history of cough and fever since 5 days and mild breathlessness since morning. He had already been diagnosed with pneumonia and was already taking antibiotics. He presented with sudden onset swelling over face since morning extending to scalp, neck, chest and both arms. The patient by then had difficulty in breathing, which worsened until evening then referred to ENT for expertise opinion.

There was no history of trauma to chest/neck. There was no positive history of foreign body ingestion, choking or stridor given by parents. Child was completely immunized as per IAP schedule. On examination, child was tachypnic and tachycardia was present. Swelling was clinking, crepitant and crunching on palpation and tender on touch (i.e. uncommon sign of subcutaneous emphysema) [Fig. 1]. Respiratory system revealed centrally situated trachea, bilateral air entry equal and crepitations mainly on left side.

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Chest X-ray revealed emphysematous right lung with air shadows in neck, axillae and mediastinum [Fig. 2]. High Resolution Computed Tomography (HRCT) of chest showed soft tissue density in the right main bronchus causing complete luminal obstruction possibly foreign body, with a hyper inflated right lung. Due to ball valve mechanism with pneumomediastinum extending to retroperitoneum caudally and paravertebral soft tissue of the neck and bilateral neck spaces cranially with subcutaneous emphysema in neck and chest [Fig. 3].

Immediately patient was subjected to rigid bronchoscopy under general anesthesia. It revealed foreign body

Fig. 1 Child with massive surgical emphysema over chest, neck, face and scalp

Fig. 2 Chest X-ray revealed emphysematous right lung with air shadows in neck, axilla and mediastinum.

Fig. 3 HRCT of chest showed soft tissue density (foreign body) in the right main bronchus

(groundnut piece) in right main bronchus with thick yellowish secretions that were sucked out, and foreign body was removed in Toto. Respiratory distress completely regressed immediately. Subcutaneous emphysema resolved gradually over 10 days after removal of the foreign body. Patient was discharged without complications [Fig. 4]. and follow up after a week was within normal limit.

Pathophysiology

Children are more prone to aspirate foreign material for several reasons. The lack of molar teeth in children decreases their ability to chew food sufficiently, leaving larger chunks of food. The propensity of children to talk, laugh, and run around while chewing also increases the chance that a sudden or large inspiration may occur with food in the mouth. Children often examine even nonfood substances with their mouth. (Michael R Bye 2005).

Subcutaneous emphysema occur secondary to foreign body because of peculiar arrangement of facial planes in the neck, chest and abdomen, and an excessive pressure gradient at the alveolar level, facilitating extra alveolar migration of air in the subcutaneous tissue [3]. In our case, occasionally the foreign body, this was present in the right main bronchus, works as a valve permitting air to enter but not to leave again. Increasing air pressure in the pulmonary alveoli caused their rupture and escaping air along the large pulmonary vessels to the mediastinum. From there the emphysema extended to the chest, neck and scalp through the subcutaneous tissue. A high index of suspicion for tracheo-

Fig. 4 After 10 days child was discharged happily

bronchial foreign body is required in atypical presentation of subcutaneous emphysema.

Discussion

Tracheobronchial foreign body aspirations comprise the majority of accidental deaths in childhood. Gulati et al reported that groundnut (locally known as *Moongphali*) was the most common foreign body of tracheobronchial tree in winter months since it is quite cheap and commonly eaten commodity and is given to appease crying children by their ignorant parents realizing little about its potential of tracheobronchial aspiration.

Foreign body in lower air way is very frequently encountered and is a potentially life threatening one. However, in absence of definitive history of foreign body, it is not always immediately diagnosed. Foreign body aspiration can result in a great variety of symptoms of varying severity, or it even can be completely asymptomatic.

While dealing with the patients with symptoms related to airways without positive history of foreign body and not responding to medical treatment, one should be vigilant

enough and possess a high index of suspicion for tracheobronchial foreign body. If both are absent, there is a delay in reporting due to misdiagnosis and inappropriate treatment given at peripheral centers. Besides a variety of diverse cultural, social and economic factors that include the parents' attitudes, illiteracy, eating habits, the availability and types of potentially threatening objects, poverty and prevention strategies. These are the additional factors to have delay in reporting to specialist, appropriate diagnosis and treatment. Therefore, proper use of diagnostic techniques provides a high degree of success in management of such condition. Uncommon x-ray findings like pneumothorax, pneumomediastinum, and presentations like massive subcutaneous emphysema of sudden onset must make one suspect an underlying foreign body bronchus.

Conclusion

Foreign body aspiration by children is a serious and life-threatening situation that requires special attention of parents and health-care providers. The symptoms may be atypical. Unusual signs like subcutaneous emphysema and normal or uncharacteristic chest radiograph findings makes it necessary that the treating paediatrician must always keep the foreign body in mind when dealing with a respiratory case. The combination of history, clinical signs and radiological signs are more specific than each one separately. Chevalier Jackson's advice (1950) about the need for educating the parents and doctors about foreign bodies in the respiratory tract and their presentation is as valid today as it was when it was pronounced.

References

1. Gulati SP, Kumar A, Sachdeva A, Arora S (2003) Groundnut as the commonest foreign body of tracheobronchial tree in winter in Northern India. An analysis of fourteen cases. *Indian Journal of Medical Sciences*. 57(6):244–248
2. Narwani Sanjay, Bora MK, Samdhani Sunil, Sharma Man Prakash, Bapna AS (2005) Foreign body in bronchus: An unusual presentation. *Indian Journal of Otolaryngology and Head and Neck Surgery* 75 (2):161–162
3. Ratageri Vinod H, Shepur TA, Pol Ramesh R (2006) Foreign body – What is unusual?. *The Indian journal of pediatrics* 73(5):542–453
4. Oliveira CF, Almeida JF, Troster EJ, Vaz FA (2002) Complications of tracheobronchial foreign body aspiration in children: report of 5 cases and review of the literature. *Rev. Hosp. Clín. Fac. Med. S. Paulo* 57(3):108–111