Singapore Med J 1998; Vol 39(10):471-472

Diagnostic Red Herring in an Infant with Stridor:

Y T Chen, R Singh, R H Brett

ABSTRACT

Foreign body aspiration in children may present with a variety of symptoms. We report here an unusual case of laryngeal foreign body in an infant masquerading as laryngeal web in its clinical presentation as well as radiological findings. The diagnosis was only made at endoscopy, thus emphasising the limited sensitivity of radiographic studies in identifying this condition.

Keywords: foreign body aspiration, stridor, airway obstruction

INTRODUCTION

Stridor in a child may be due to a variety of congenital or acquired causes. We present an interesting case of foreign body aspiration with atypical clinical presentation and unusual radiological findings.

CASE PRESENTATION

A one year old female infant was referred for the problem of noisy breathing. According to her mother, the child's symptoms began with hoarseness of voice one month prior to presentation which gradually developed into noisy breathing. There were no associated fever, chills, rigors, cough or sputum production. The child had been delivered via normal vaginal delivery at full term. No respiratory problems were noted at birth and she had been well until the present admission. Her mother could not recall any precipitating event, such as choking, which might have led to the current problem.

On physical examination, the child was noted to exhibit inspirational stridor. She was otherwise afebrile and acyanotic. She was not dyspnoeic and her vital signs were normal. On auscultation of the lungs, breath sounds were equal and clear bilaterally. Examination of her other systems were unremarkable. She was able to vocalise and drink fluids without difficulty.

The child already had a chest X-ray as well as a spiral CT scan of her larynx done earlier that day in a private hospital. The CXR did not reveal any radio-opaque foreign body nor any increase in translucency of the lung fields. However, the CT scans demonstrated a soft tissue density at the level of the larynx bisecting the vocal cords causing airway narrowing (Fig 1). This was reported by the radiologist

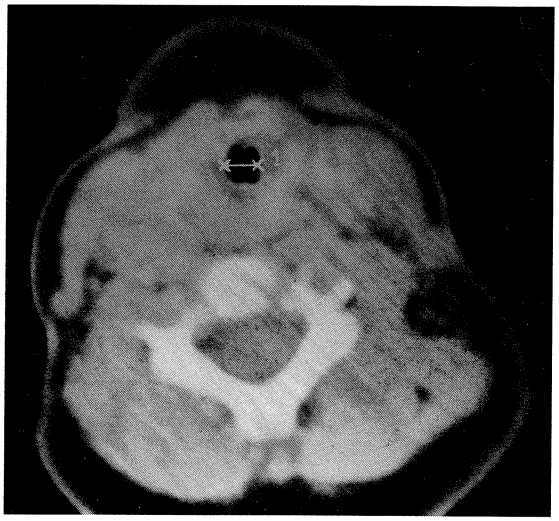

Fig 1

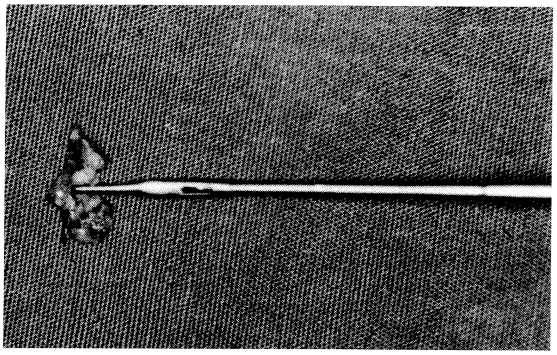

Fig 2

to be suggestive of a laryngeal web. No radio-opaque foreign body was seen and the remaining trachea appeared normal. Full blood count was normal.

In view of the child's respiratory symptoms and radiological findings, endoscopy under anaesthesia was arranged. At laryngoscopy, a piece of chicken bone (Fig 2) was found lodged at the anterior commissure between the vocal cords. It was successfully removed using a pair of grasping forceps. There was no evidence of a laryngeal web and no other abnormalities were found. The child was well post-operatively and did not exhibit any more stridor.

DISCUSSION

Stridor in an infant with respiratory symptoms suggests upper airway obstruction. The Barnoulli principle states that the pressure gradient across a segment of airflow in a hollow structure is inversely

Department of Otolaryngology
Changi General Hospital
2 Simei Street 3
Singapore 529889

Y T Chen, MBBS
Medical Officer

R Singh, FRCS
Registrar

R H Brett, FRCS
Consultant

Correspondence to:
Dr Y T Chen

related to the cross-sectional area of that structure. Due to the intrinsic structure of the larynx, the resistance to airflow at any given glottic aperture is greater in inspiration than in expiration. Hence, airway narrowing from any cause leads to rapid, turbulent airflow resulting in stridor[1].

There are many differential diagnoses for stridor. Prior knowledge of the age of onset of stridor helps to narrow down the list. Neonatal causes are usually congenital in nature, such as congenital cyst, laryngeal web, laryngomalacia, subglottic stenosis and tracheomalacia while childhood causes include epiglottis, croup, peritonsillar abscess, extrinsic compression and foreign body aspiration[2]. Both laryngeal web and subglottic stenosis may also present in childhood.

Foreign body aspiration in children may present with respiratory symptoms days or months after aspiration has occurred. Seventy-five percent of cases occur in children under 3 years of age. The symptoms and physical findings depend on the size and nature of the foreign bodies as well as the degree of obstruction produced. Up to 90% of children have a suggestive history such as choking or an acute episode of paroxysmal cough. The complete triad of coughing, wheezing or absent breath sounds is present in only 40% of cases[3]. Other symptoms of laryngeal foreign bodies include hoarseness of voice, aphonia and cough resembling that of croup. Laryngeal oedema and suppuration may also occur[4]. Delays in presentation are common as concern about the primary event becomes more distant with the passing of time. In addition, 25% of children may be asymptomatic at the time of presentation.

In our patient, the absence of constitutional symptoms such as fever and cough excluded the likelihood of infective causes such as croup, epiglottis or peritonsillar abscess. The possibility of foreign body aspiration had been low on the list of differential diagnosis as her initial clinical presentation had been rather non-specific, starting off as insidious onset of hoarseness of voice instead of a primary event such as choking or bouts of paroxysmal coughing. Moreover, her CT results, coupled with negative CXR findings, had favoured the likelihood of a laryngeal web – a diagnosis which is quite consistent with her overall clinical picture. Laryngeal webs are congenital developmental abnormalities resulting from the incomplete separation of the fetal mesenchyme between the two sides of the larynx. They usually occur at the anterior commissure of the vocal cords and may extend posteriorly for as much as three-quarters of the glottis[5] – somewhat resembling the CT scan findings of our patient. Clinical presentation may be that of stridor in neonates or hoarseness of voice and aphonia in childhood. Direct laryngoscopy is necessary for prompt diagnosis and treatment.

About 85% of foreign bodies are bronchial while the remainder are laryngotracheal. The latter is associated with a higher mortality rate as diagnosis is more difficult. Only 6% – 17% of airway foreign bodies are radio-opaque; most patients have non-diagnostic films. In addition to the usual CXR, other useful films are lateral neck films, lateral decubitus views and assisted expiratory views. Radiological signs which may suggest the presence of retained airway foreign bodies include differential inflation of the affected lung, reabsorption atelactasis beyond the site of bronchial obstruction, and pulmonary infiltrates secondary to reactive inflammation[3].

However, such differential findings are often absent in laryngotracheal foreign bodies, as in our patient, or in cases of bilateral bronchial foreign bodies. Esclamado reported positive findings on chest radiographs in only 42% of children with laryngotracheal foreign bodies, but a higher rate of positive findings in lateral neck films in the same series[6]. A lateral neck film was not ordered for our patient as she already had a CT scan done. While CT scanning has been advocated for foreign body imaging, it may not be diagnostic because of respiratory movements resulting in poor films. Sedation may be risky in the presence of airway compromise. No attempt was made to sedate our patient during CT scanning. Although the child's respiratory function was not severely compromised, direct laryngoscopy under anaesthesia was arranged in view of persistent stridor. This procedure, as well as bronchoscopy, is usually diagnostic.

Respiratory support is of utmost importance in the immediate management of upper airway obstruction. The patient must be kept under close observation and oxygenation must be adequate. Tracheostomy or intubation should be performed if there is suspicion of deteriorating airway function. Definitive treatment involves correction of the underlying cause of obstruction.

CONCLUSION

Foreign body aspiration must always be considered in the differential diagnoses of a child presenting with symptoms of upper airway obstruction, bearing in mind that the initial presenting complaints may be atypical and that radiological studies may be non-diagnostic in a significant number of cases. Clinical judgement must dictate whether a child should be subjected to diagnostic endoscopy.

REFERENCES

1. Giannoni CM. Laryngomalacia. Grand Rounds Archive of The Baylor College of Medicine, Houston, Texas. February 10, 1994.
2. Stockman JA, Corden TE, Kim JJ. Summary of Stridor Causes. Pediatric Book of Lists, Mosby Year Book, St Louis, MO, 1991, p 267.
3. Boychuk RB. Foreign Body Aspiraion in a Child: Radiology cases in Pediatric Emergency Medicine, Kapiolani Medical Center for Women and Children, University of Hawaii John A. Burns School of Medicine. Vol 1, Case 8.
4. Stern PC. Foreign Bodies in the Lrynx, Trachea and Bronchi. Nelson Textbook of Pediatrics. Sunders 13th Ed: 891-2.
5. Birrell JF. Paediatric Otolaryngology. Wright 2nd Ed 1986:200-2.
6. Esclamado RM, Richardson MA. Laryngotracheal Foreign Bodies in Children. Am J Dis Child 1987; 141:259.