

Inhalation of wild barley into the airways

Two different outcomes

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ABSTRACT

Objective: There are only two previous reports of wild barley inhalation into the tracheobronchial tree in the literature. Our aim is to describe the effects, outcome and management of wild barley inhalation into the airways.

Methods: In a retrospective study, 18 patients with inhalation of spike of wild barley into the tracheobronchial tree were divided into 2 groups according to their clinical presentation.

Results: Eighteen children below 5 years of age presented between 1989 and 1994 inclusive. Fourteen patients presented with a short duration of choking and cough. The wild barley spike was removed by

laryngoscopy (12 patients) or rigid bronchoscopy (2 patients). Four patients presented with a longer history of cough, dyspnea and fever and had serious respiratory disease such as pneumothorax, lobar pneumonia and pleural empyema requiring surgical intervention. All patients made a satisfactory recovery.

Conclusion: Wild barley is a common grass in our area and we should be aware that children are exposed to the risk of inhalation into the airways.

Keywords: Wild barley, tracheobronchial tree, inhalation, pneumothorax, emphyema, pneumonia.

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Inhalation of a foreign body into the tracheobronchial tree is a common problem particularly in children. Approximately 40% of foreign body inhalations occur in children below 2 years of age,¹ and among children 81% are below 3 years of age.² The majority of foreign bodies (70%) are of plant origin.^{1,2} Most organic foreign bodies produce marked inflammatory changes to the airways because of chemical irritation, but some are inert. Wild barley falls into the second group, it resists organic decay and its effects in the lung are due to pure mechanical penetration and obstruction.^{3,4}

Wild barley (Figure 1) is a common grass in the spring season and grows in uncultivated areas around houses and in parks, where children play unattended, and are exposed to the risk of inhalation.

Methods. In this retrospective study we retrieved the files of the 18 patients who had inhaled a spike of wild barley into the tracheobronchial tree between 1989-1994. All cases were presented in April and May which is the flowering season of wild barley. There were 10 males and 8 females with a mean age of 2.4 years and an age range of 1.5-4.5 years. There was no history of inhalation on 14 of the 18 cases.

Results. The patients were divided into 2 groups according to their clinical presentation. Group 1 included 14 patients who presented with choking and cough of short duration. In 12 patients the spike of wild barley or part of it was found in the postnasal

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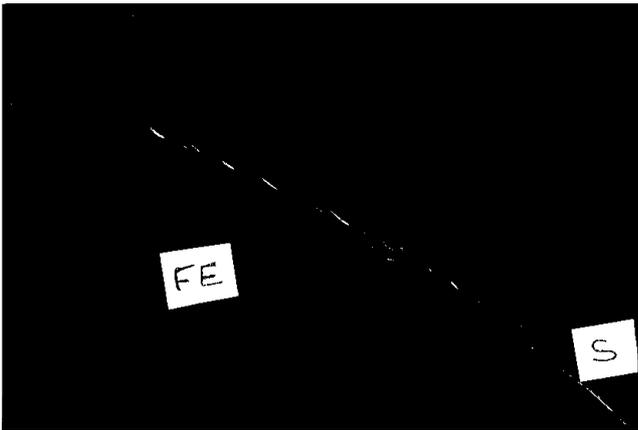


Figure 1 - A spike of wild barley showing S-stem and FE-flowering end.



Figure 3 - A chest x-ray of a child showing pleural empyema due to inhalation of a spike of wild barley.

space or in the post tonsillar fossa. It was removed by direct or indirect laryngoscopy in the accident and emergency department and the patients were discharged home. In the remaining 2 patients, rigid bronchoscopy was required to remove the spike of wild barley from the right main bronchus. Both patients recovered uneventfully and were discharged home the following day.

Group 2 included 4 patients who presented with a long duration cough, dyspnea and fever. The date of aspiration was estimated from the initial symptoms of cough, choking and stridor and the interval between aspiration and operation was between 3-10 weeks. One patient presented with subcutaneous abscess (empyema necessitans) overlying the area between the 10-12 ribs laterally with a history of recurrent chest infection for the last 10 weeks. The abscess was incised and drained and a spike of wild barley was found. The patient recovered and discharged home few days after surgery. A second patient presented with tension pneumothorax (Figure 2) and

was managed with urgent insertion of intercostal chest tube. Chest tubes were inserted in the remaining 2 patients to drain pleural empyema (Figure 3) which failed to control it. Eventually, thoracotomy and decortication was carried out for all the patients with chest tubes and a spike of barley or part of it was found in the pleural cavity (Figure 4). Before surgery, antibiotics were given to all the patients in this group but it failed to control the infection.

Discussion. Foreign bodies in the larynx are a cause of mortality and morbidity in children. Any child in coma or not breathing should be suspected of having inhaled a foreign body⁵ and the Heimlich maneuver should be immediately applied as a first aid measure.⁶ The effects of wild barley are due to its ability to drive itself against the movement of the mucus membrane, provided that the entry of the spike into the airways was by the stem first followed by the flowering unit.^{3,4} The essential factor in

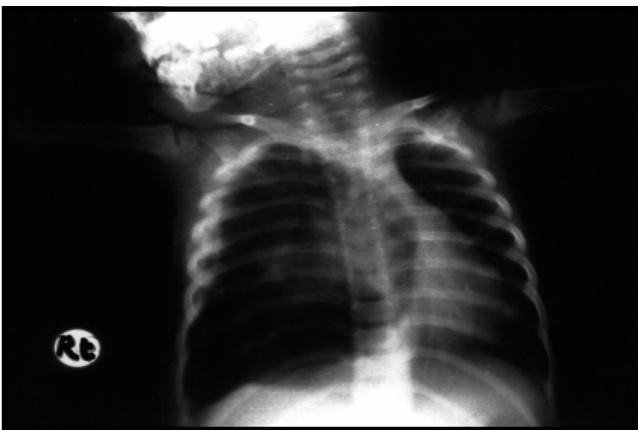


Figure 2 - Chest x-ray of a child showing tension pneumothorax due to inhalation of a spike of wild barley.

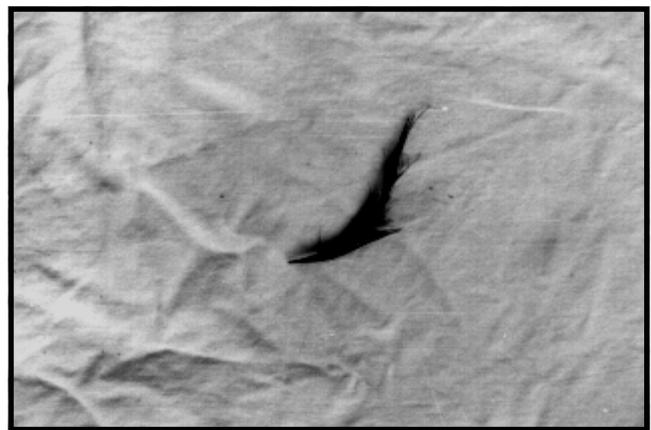


Figure 4 - A spike or parts of it were found in the pleural cavity.

affecting the clinical outcome is the difference of entry of the spike into the airways, flowering unit first versus stem first.³ In group 1 patients, the spikes entered the airways by the flowering unit first, moved slowly and then settled in the postnasal space, post tonsillar fossa or the right bronchus. The symptoms were of short duration. The removal of the spike was easy and complete either with laryngoscopy or with bronchoscopy. In group 2 patients, the spikes entered the airways by the stem first, migrate rapidly into the right bronchus and then penetrated the lung parenchyma, they either settled in the parenchyma or passed into the pleural cavity and consequently the patients presented with pneumothorax, lobar pneumonia, pleural empyema and empyema necessistans. Early intervention by bronchoscopy is mandatory, especially in a child with airway disease not responding to appropriate medical therapy.² The findings and results were similar to previous reports.^{3,4}

A normal chest radiograph does not rule out foreign body inhalation as 35% of bronchial foreign bodies may not show on a chest radiograph.⁷ The use of a xenon-133 gas scan was found to be useful in the selection of patients for bronchoscopy.⁸ Rigid bronchoscopy remains a safe and life saving technique for the extraction of foreign bodies from the trachea and the main bronchi.⁹ The fiberoptic bronchoscope is very useful for visualization of the airways especially of the peripheral bronchial tree.

The development of extraction techniques by encasement,² or by a modified suction tube,¹⁰ has led to easier ways of dislodging impacted or crumbled foreign bodies.

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