

Air leak syndrome and respiratory distress after green chilli aspiration in a child

Sir,

Foreign body aspiration is a common cause of mortality and morbidity in children.^[1] We present a 2-year-old, 12-kg female admitted to our emergency with fever, difficulty in breathing and repeated episodes of vomiting for last 16 hours. The child had been playing with raw chillies before she became symptomatic. On examination, the child was in distress with reduced air entry on the right side and generalised crepitus over the neck and supraclavicular regions, suggesting subcutaneous emphysema. Her respiratory rate was around 50 breaths/minute. Oxygen saturation was 95% on oxygen at 6 litres/min by face mask. Computed tomography (CT) scans revealed a pneumomediastinum, pneumopericardium, subcutaneous emphysema, pneumothorax with collapsed right lower and a hyper-inflated right upper lobe [Figure 1]. Suspecting a foreign body aspiration, decision for its bronchoscopic removal was taken. In the bronchoscopy suite, pulse-oximeter, electrocardiogram and noninvasive blood pressure were attached. Child was adequately preoxygenated and then inj fentanyl 2 μ /kg was given followed by propofol and succinylcholine at 2 mg/kg each. Rigid bronchoscopy was performed with intermittent manual ventilation. A green chilli, with its conical end distal and the wide base proximal, wedged into the right main bronchus,

was removed in the second attempt. Procedure lasted about 10 min [Figure 2]. However, soon after the removal, child developed severe bronchospasm. On auscultation, bilateral air entry was reduced. The child was immediately intubated with a size 4-mm internal diameter endotracheal tube. Salbutamol puffs with 2 ml (1:1000) solution of adrenaline nebulisation were given along with intravenous hydrocortisone 20 mg and 100% oxygenation till saturation returned to 92%–93%. Air entry on right side was grossly reduced and a decision to place an intercostal drain was made to manage the pneumothorax. The child was shifted to the paediatric intensive care unit. Post procedure, respiratory distress subsided, pneumomediastinum improved gradually and the child could be weaned off from the ventilator. Child was successfully extubated on the next day.

Children less than 3 years of age are at risk for foreign body aspirations.^[2] Pneumomediastinum, pneumopericardium, pneumothorax and subcutaneous emphysema together constitute what is called the ‘air leak syndrome’. A possible mechanism of developing the above-mentioned findings in this child could be that the impacted chilli behaved like a one-way valve. This caused air trapping more distally in the airways which slowly increased intra alveolar pressures, leading to alveolar membrane rupture. Air then dissected its path along blood vessels, causing pneumo-mediastinum. This may reach pericardial spaces to cause pneumopericardium, then pneumothorax and even subcutaneous emphysema up to the neck. Another school of thought is that sudden and marked increases in airway pressures due to cough or respiratory strain disrupt the mucosal integrity. Through this disruption, air enters adjoining

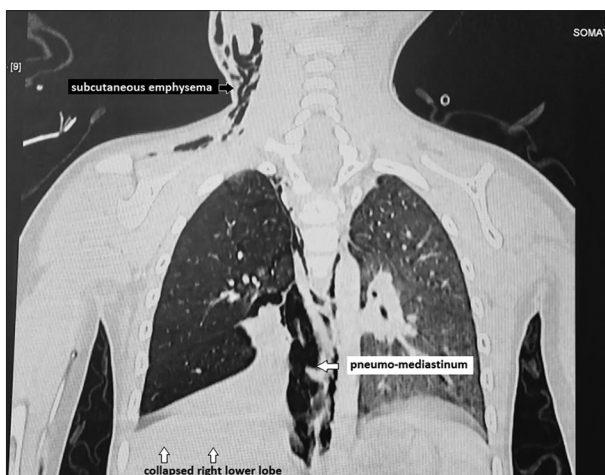


Figure 1: CT scan image showed pneumomediastinum, pneumopericardium, subcutaneous emphysema, pneumothorax with collapsed right lower and a hyper-inflated right upper lobe



Figure 2: A cut part of the green chilli

tissues under pressure which can then travel along the perivascular and peri-bronchial interstitial tissues to the mediastinum leading to pneumo-mediastinum. Fascial planes arrangement in the neck subsequently allows air migration to pneumothorax and then subcutaneous emphysema.^[3,4] Air leak syndrome, however, is a very rare occurrence. Only 1%–2% of children show all the features described.^[5] Some children could remain asymptomatic; however, in our case, the child was acutely distressed.^[6] The danger in such patients is that margin of safety is low as we noted in our case. Presence of pneumothorax and collapse of right lung could jeopardise the already poor oxygen reserve of any child during bronchoscopy. Pre-procedure placement of a chest tube drain was contemplated, but improbability of the obstructed lung to expand dissuaded us. This decision in hindsight could have been erroneous on our part and we would advocate early placement of a chest tube in similar cases. One solace is that many of the complications encountered during bronchoscopic foreign body removal in a small child resolve rapidly once airway obstruction is relieved.

During bronchoscopic retrieval of a foreign body in small children, technical difficulties may arise which can complicate the procedure and jeopardise oxygenation with catastrophic consequences. Thus, good preparedness anticipating all complications and taking additional help from experienced colleagues will make the bronchoscopic removal a smooth procedure averting serious complications.

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Conflicts of interest

There are no conflicts of interest.

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