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Acute Plastic Bronchitis

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Plastic bronchitis is a rare disorder characterized by the formation of bronchial cast. The etiology is obscure, though usually associated with conditions like asthma, aspergillosis, pneumonia, cystic fibrosis and cardiac problems.

Keywords: Foreign body, Plastic bronchitis.

Plastic bronchitis is a rare disorder characterised by the formation of branching mucoid bronchial casts(1). It is usually associated with underlying pulmonary diseases

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like bronchial asthma, allergic broncho-pulmonary aspergillosis, cystic fibrosis, bronchiectasis and at times other system diseases like congenital heart defects and sickle cell disease(2). Plastic bronchitis presenting as acute respiratory distress with wheezing, breathlessness, and cough, mimicking foreign body aspiration had been reported(3,4). Any child with acute respiratory distress refractory to conventional medical therapy with unusual radiographic picture needs intraluminal evaluation with bronchoscopy for proper management(5).

Case Report

A one-year-old female child, second born to third degree consanguineous parents was admitted with complaints of cough, fever for two days and progressively increasing breathlessness. There was no history of foreign body aspiration or similar episode previously. Clinically the child was irritable, tachypneic with respiratory rate of 70/min and heart rate of 142/minute. Auscultation demonstrated normal vesicular breath sounds on both sides with rhonchi. Other systems were essentially normal. Chest skiagram

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showed hyperaeration on the right side of the lung with pneumonia of left upper lobe. With the above clinical picture a provisional diagnosis of foreign body aspiration was made. Child was given supplemental oxygen to keep oxygen saturation above 92%. Nebulised salbutamol and intravenous antibiotics were instituted along with intravenous fluids. Child was subjected to rigid bronchoscopy under general anesthesia.

Bronchoscopy demonstrated a whitish material completely occluding the airway from the lower half of trachea and while attempting removal, proximal portion was fragmented which looked like cheesy material. Second attempt was carefully made, when a bronchial cast of 7 cm length with multiple branches resembling wax model of the bronchial tree (*Fig. 1*) was removed *in toto* and the specimen was sent for histopathological examination. After removal

of the bronchial cast the child's general condition improved, respiratory distress got reduced and X-ray taken on the same day demonstrated reduction of hyperaeration. Blood investigations were within normal limits. Gastric lavage for acid fast bacilli, Mantoux test and HIV serology were negative. Sweat chloride was 46 mEq/L. CT chest (done after 10 days) and echocardiography were within normal limits. Histopathology of the cast revealed mucin with moderate inflammatory cells. Bronchoalveolar lavage specimen grew *Klebsiella*. Flexible bronchoscopy did not show any new cast formation. The child was discharged after 18 days and got readmitted for pneumonia and wheezing after one week. Repeat fiberoptic bronchoscopy twice in the second admission did not reveal any bronchial cast. In spite of intensive monitoring, antibiotics, bronchodilators and ventilatory support, the child progressed to respiratory failure and succumbed after three weeks.

Discussion

Plastic bronchitis was described as early as 1902(6). It has also been called "fibrinous bronchitis", "pseudomembranous bronchitis", "Hoffman's bronchitis" and "cast bronchitis". It usually mimics foreign body aspiration or status asthmaticus and may present as acute life threatening respiratory failure as in this case. A high degree of suspicion is necessary to make the diagnosis(7). Plastic bronchitis has been reported from newborn period upto seventh decade but its exact pathophysiology is unknown. The bronchial casts may be divided into two types. *Type 1*, inflammatory cast with fibrin with cellular infiltrates, (eosinophils) associated with inflammatory diseases of the lung and *Type 2*, a cellular cast made up of mucin with few cells usually associated with congenital cyanotic heart disease(8,9).

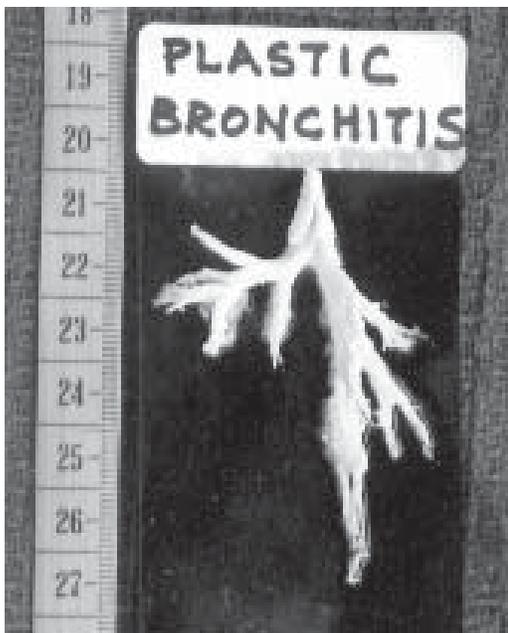


Fig. 1. Bronchial cast resembling wax model of bronchial tree.

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In plastic bronchitis, difficulty in clearing the thick inspissated mucus promotes bacterial colonisation which in turn predispose for more viscid secretions resulting in a vicious cycle and progressive lung damage. The common causes include asthma, allergic bronchopulmonary aspergillosis, chronic bronchitis, cystic fibrosis and pneumonia. Other causes are pulmonary hemorrhage, tuberculosis, bronchiectasis and cardiac problems. Treatment should be directed to the underlying disorder and efforts should be made to remove the casts. The medications that have been reported to be useful include beta agonists, theophylline, corticosteroids, and N-acetylcysteine and aerosolised urokinase(10). Chest physiotherapy and bronchoscopic removal have also been reported to facilitate removal of casts(8).

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