Successful bronchoscopy in a pregnant patient with plastic bronchitis

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ABSTRACT

Plastic bronchitis is a rare disorder, characterized by formation of thick fibrinous bronchial casts which can obstruct the airway and present as a life threatening emergency (1). It is more common in the pediatric population after corrective or palliative surgery for congenital heart disease like fontan procedure but has rarely been reported in adults as well (1). Pregnancy is a relative contraindication for bronchoscopy. Bronchoscopy in the pregnant patient poses significant risks as manipulation of the airway can lead to impaired oxygenation and ventilation. In addition, the drugs used during this procedure to provide sedation can have a direct impact on the developing fetus (2). In spite of these risks bronchoscopy should not be withheld in an emergent situation as it can be a lifesaving measure. We report a case of successful bronchoscopy using Propofol as the sedating agent in a pregnant female with plastic bronchitis who presented with respiratory distress.

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1. Case description

A 19 year old female presented to the emergency room with complaints of cough associated with thick gelatinous expectoration and dyspnea that had started 6–8 hours prior to presentation. She had a history of congenital heart disease for which she had undergone Fontan procedure in her infancy. Prior to this episode, she had multiple similar episodes and was diagnosed with plastic bronchitis. Her vitals were initially stable but then she developed hypoxia with oxygen saturation dropping to 90% requiring 100% FiO2. On her initial blood work she was found to be pregnant. She had a history of congenital heart disease particularly after surgical correction using Fontan procedure where it can occur in up to 4% of patients[1]. Bronchial casts can be seen in diseases associated with diffuse bronchial hypersecretion like asthma, bronchopulmonary aspergillosis, mucoviscidosis [4–6]. They can also occur in patients with congenital heart disease particularly after surgical correction using the Fontan procedure where it can occur in up to 4% of patients [1].

On inspection, there was a large plaque like secretion completely obstructing the left main bronchus extending beyond the carina into the trachea. Using forceps, a large bronchial cast was extracted from trachea and left main bronchus as shown in Figs. 1 and 2. Inspection of the rest of the airways showed otherwise patent airway. Hypoxia improved after removal of casts but patient remained intubated for a period of 48 hours. She became hypoxic on day 2, bronchoscopy was repeated to remove residual cast. During the second bronchoscopy the cast had recurred in the left main bronchus, this time endobronchial N-acetylcystine was used as an adjunct to help remove the cast. Patient tolerated the procedures well. The patient had no further exacerbations from plastic bronchitis during the rest of the pregnancy and had a successfully delivery at 37 weeks. The microscopic evaluation of the bronchial cast showed acellular material and bronchial lavage was negative for infection.

2. Discussion

Plastic bronchitis is a rare disorder characterized by formation of casts of varying size that can cause obstruction of an entire lung [3]. Bronchial casts can be seen in diseases associated with diffuse bronchial hypersecretion like asthma, bronchopulmonary aspergillosis, mucoviscidosis [4–6]. They can also occur in patients with congenital heart disease particularly after surgical correction using the Fontan procedure where it can occur in up to 4% of patients [1].
The exact pathophysiology of plastic bronchitis in congenital heart disease is unknown. Lymphatic dysfunction, endobronchial lymph leakage, and mucus hypersecretion due to elevated venous pressure have all been proposed as possible mechanisms [7]. Plastic bronchitis has been classified based on histology into cellular and acellular [8]. Alternatively, plastic bronchitis has been classified according to the associated disease state [9]. The cast morphology of plastic bronchitis in patients with congenital heart disease post corrective surgery is typically acellular and presents as a recurrent disease, like our patient.

Plastic bronchitis can present as a life threatening condition as in our patient. Cardiopulmonary stabilization with intubation and mechanical ventilation is the mainstay of treatment in acute life threatening emergencies. Airways clearance with immediate rigid mechanical ventilation is the mainstay of treatment in acute life threatening emergencies. Airways clearance with immediate rigid mechanical ventilation is the mainstay of treatment in acute life threatening emergencies. Airways clearance with immediate rigid mechanical ventilation is the mainstay of treatment in acute life threatening emergencies.

In conclusion, plastic bronchitis is a rare disorder which can present as a life threatening emergency and its presence in conjunction with pregnancy can make management very difficult. Bronchoscopy which would be otherwise contraindicated in pregnancy can be entertained when it is required to treat a life threatening condition and there are no alternative therapies. As demonstrated in this case, with judicious use of appropriate agents, bronchoscopy can be successfully employed during pregnancy with good outcomes for both the mother and the fetus.

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