

Lung Collapse in Intubated Patient is not Always because of Tube Factor?

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Case Summary

50 year old male, diagnosed case of Chronic Obstructive Pulmonary Disease (COPD) was admitted to ICU as a case of cellulitis of left lower limb with septic shock and multi-organ dysfunction. On admission, he was managed with intravenous fluids, vasopressor (nor-adrenaline), broad spectrum antibiotics, nebulisation and mechanical ventilation. Gradually, he showed improvement clinically as well as in laboratory parameters. On fourth day, he became haemodynamically stable, maintaining oxygen saturation on minimal ventilatory support (Pressure Support mode) and was planned for extubation on the next day. But, he developed respiratory distress (respiratory rate 35/minute, use of accessory muscle present) while on Pressure Support Ventilation along with hypoxemia. He was immediately placed on control mode of mechanical ventilation with tidal volume of 350 ml (6 mls/kg) which showed high airway pressures (PIP>40 cm H₂O) with every inspiratory effort. Suctioning of the endotracheal tube was done with a 12 Fr Gauge suction catheter by open method which could be negotiated up to the carina with minimal secretions being aspirated with poor cough reflex. Chest auscultation revealed diminished air entry on left side. The position of the tube was re-confirmed with direct laryngoscopy. Chest radiograph revealed collapse of left lung with endotracheal tube in situ and at proper position (Figure 1). In view of whole left lung collapse and worsening hypoxemia, immediately fiberoptic bronchoscopy was done which showed thick mucus plug in the left main bronchus which after toileting was removed, following which left lung fully expanded (Figure 2).



Figure 1: Chest X-ray showing atelectasis of left lung with endotracheal tube in situ.



Figure 2: Chest X-ray showing complete expansion of left lung.

Discussion

Bronchial intubation on right side is common, because of the anatomy of right main bronchus, which may lead to acute left lung collapse. However, other reasons for acute lung collapse are kinking of tube, obstruction due to mucus plug, blood clot, or some foreign body. Acute lung collapse is not always due to tube factor but may be because of airway also. Significant lung collapse due to large mucus plugs occluding major airways have been described in many lung diseases such as cystic fibrosis, bronchiectasis, allergic bronchopulmonary aspergillosis, bronchial asthma and COPD [1]. Severe mucus plugging may lead to the worsening of gas exchange, increasing inspiratory pressure and difficulty in breathing; and if not treated quickly, may lead to infectious complications and mortality [2].

Maintaining good hydration, humidification of inspired gases, chest physiotherapy and postural drainage combined with manual lung hyperinflation is considered a traditional and safe method for the prevention and treatment of atelectasis in the majority of patients [3,4]. Although studies have shown that chest physiotherapy alone is effective for the management of acute lobar atelectasis [5]. Still, Fiberoptic bronchoscopy is a useful tool which is both diagnostic as well as therapeutic in the emergency setting (our patient was having whole lung collapse with life threatening hypoxemia) [6].

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