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Letter to the Editor

Oxygen through suction port: use of a three way stopcock during fiberoptic bronchoscopy

Sir

Fiberoptic bronchoscopy (FOB) provides direct visual examination of airway and it has got both therapeutic and diagnostic values. Rapid oxygen desaturation is a commonly encountered situation during fiberoptic bronchoscopy especially in patients having coexisting cardio respiratory disease. There are various causes of hypoxia during fiberoptic bronchoscopy (FOB) and these are sedative medications, size of bronchoscope compared to glottis, depletion of oxygen from lungs during suctioning, bronchospasm and laryngospasm etc. There are several methods used during FOB as oxygenotherapy and they are:

- nasal cannula;
- nasal prongs-continuous positive airway pressure;
- nasopharyngeal catheter;
- intratracheal catheter;
- administration of sedation reversal medication;
- removal of the bronchoscope;
- bag-and-mask ventilation and;
- endotracheal intubation and ventilation [1,2].

Presented here is a case of hypersensitive pneumonitis posted for FOB guided biopsy and bronchioalveolar lavage. After shifting the patient to the operating room, all standard monitoring parameters like electrocardiography, oxygen saturation and non-invasive blood pressure measurement were set up and their baseline values were noted. The baseline SPO_2 was 94% on an O_2 flow rate of 4 L/min by oxygen facemask. As antisialogouge and nasal decongestant injection glycopyrrolate 0.2 mg and xylometazoline 0.1% was used. Then ultrasonic nebulisation was done using 4 mL of 4% lignocaine solution for anaesthetising the airway. We used 2% lignocaine solution as "spray as you go" (SAYGO) technique through working channel of the fiberoptic bronchoscope. For sedation and analgesia, we cautiously used injection fentanyl 1 μg/kg and injection midazolam 2 mg. Throughout the procedure, we closely monitored respiratory rate and sedation score (Ramsay sedation score) which was targeted between 2 and 3.

Now we made an assembly by connecting one end of oxygen tubing with suction port of bronchoscope and other cut end of oxygen tubing with male luer of three way stop cock (Poly Medicure Ltd Haryana India). One female luer of three-way stopcock was connected to oxygen tubing and other with suction port (Fig. 1). A three way stop cock can tolerate pressure up to 4.5 bar (65 psi), 360 rotation, it has one rotating male luer and two female luer lock connectors [3]. During bronchoscopy we gave intermittent oxygen flow (4 L/min) through three way stop cock by pressing suction valve without interruption of bronchoscopic procedure. Switching between suction and oxygen was regulated by three-way stopcock. On using this assembly, working channel was kept free for biopsy forceps and fluid for bronchioalveolar lavage. In our patient, we able to maintained SPO_2 above 94% on 4 L/min of oxygen flow and whole procedure was uneventful.

1. Discussion

The bronchoscopy oxygenation system is a device allowing the introduction of oxygen (or other gaseous substance) and instrumentation (biopsy and other forceps) through a bronchoscopy device via working channel simultaneously [4]. The various advantages of oxygenotherapy through bronchoscope using our assembly were:

- to provide continuous oxygen therapy throughout the FOB procedure and prevent rapid desaturation especially in presence of preexisting lung diseases;
- to displace the tracheobronchial secretions and defogging of the lens;

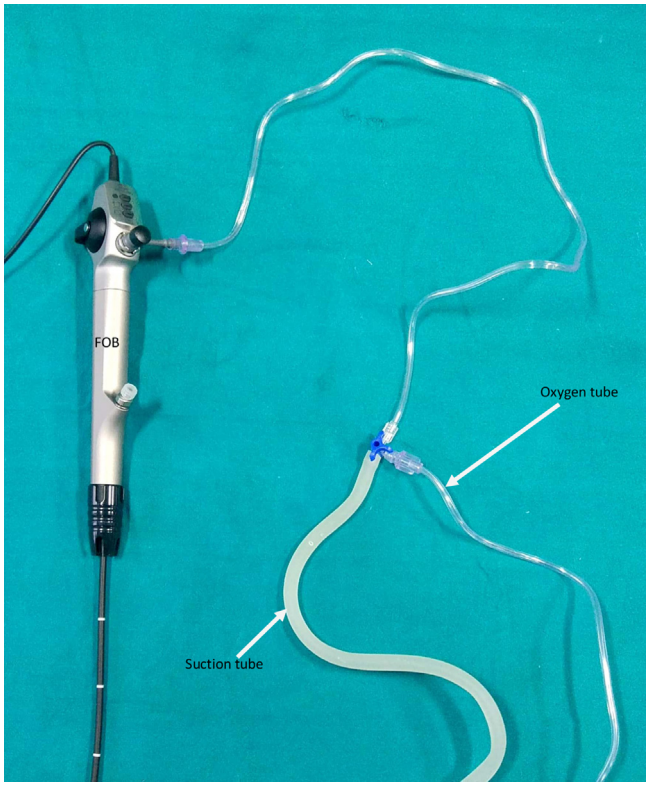

Fig. 1. Assembly for oxygenotherapy using three way stopcock.

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- to provide better visualisation of the glottis;
- the working channel was kept free for biopsy forceps and fluid for providing bronchioalveolar lavage.

A high flow nasal cannula oxygen therapy (HFNC) is a simple, effective, non-invasive, well-tolerated and safe technique to ensure oxygenation during nasal bronchoscopy with bronchioalveolar lavage [5].

The drawbacks of oxygenotherapy through bronchoscope using our assembly, especially on prolonging the FOB procedure, were increased risk of dryness of oropharyngeal mucosa, air trapping, tracheobronchial mucosal damage and pneumothorax. Gastric perforation is also a known complication of oxygen therapy on performing FOB when oxygen flow was kept for more than 4 L/min. Chapman [6] reported gastric rupture and pneumoperitoneum during oxygen insufflation via a fiberoptic bronchoscope after using intermittent oxygen 5 L/min through the working channel. An inflation pressure of 15–25 cm H_2O or oxygen flow at 5 L/min is needed to open the lower esophageal sphincter and to force oxygen into the stomach [7]. On reaching the tracheal tree, the recommended maximum oxygen flow is less than 2 L/min. But in our case, due to preexisting lung disease, we opted for oxygen flow of 4 L/min anticipating the risk of gastric perforation. However, we have not encountered any gastric insufflation in our case.

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Nill.

Disclosure of interest

The authors declare that they have no competing interest.

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