Difficult Ventilation after Successful Intubation in an Emergency:

A Case of Tracheal Stenosis

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Introduction: The American Society of Anesthesiologists defines a difficult airway as the inability of a trained anesthesiologist to mask ventilate the patient, perform tracheal intubation, or both [1]. However, a difficult airway is not always defined by patient anatomy nor does airway management necessarily end with successful placement of an endotracheal tube (ETT).

Case: A 65 year woman underwent planned rigid bronchoscopy with biopsy for intrinsic endotracheal lesion under TIVA and jet ventilation. Post-procedure, she acutely developed type 2 respiratory failure needing immediate emergent intubation in the ward. The trachea was intubated using size 7 ETT with a slight resistance beyond the glottis. Ventilation was not possible with high inspiratory pressures and no passive expiration even after changing patient's position. Hyperinflation caused cardiovascular instability. Ventilation was achieved only after intentional right endobronchial intubation and one lung ventilation. Fiberoptic bronchoscopy revealed no obstruction or collapse and it was not possible to reposition ETT to achieve bilateral lung ventilation. Subsequent CT scan revealed no pathology to explain the mechanics. The patient underwent successful insertion of tracheal stent above carina using rigid bronchoscope under TIVA.

“A ball valve mechanism”

Flap of... Clot / tissue

Ingress of gas into the lungs

No Egress

Hyperinflation

↑ Intrathoracic pressure

↓ Venous blood return

Cardiovascular collapse

Discussion: The inability to ventilate a patient after successful intubation is a rare but emergent situation and may be caused by obstruction of the endotracheal tube, bilateral tension pneumothorax, oesophageal intubation, severe bronchospasm, or main-stem bronchus intubation. We hypothesized that after successful intubation, a ball valve mechanism due to tumour allowed ingress of gas into the lungs but prevented egress and caused hyperinflation of the patient's chest. The resultant increased intrathoracic pressure impeded venous blood return and ultimately led to cardiovascular collapse. Prompt diagnosis and correction of this emergency is utmost important.

Learning Points: In our patient conventional ventilation technique was not suitable, or even was catastrophic and tracheotomy was not an option. We opted for modified endobronchial rescue intubation technique for ventilation to maintain the cardiorespiratory stability until definitive surgical intervention.

References:

1. American Society of Anesthesiologists Practice guidelines for management of the difficult airway: an updated report. *Anesthesiology* 2013; 118: 251-270
2. Dongelmans DA, Jonkers RE, Shultz MJ. Case report: a ball valve blood clot in the airways—life-saving whole tube suction. *Crit Care* 2004;8(5): R289–90