Use of the *Ventrain®* in a patient with complete upper airway obstruction preventing expiration during high frequency jet ventilation

R A Fearnley1, S Badiger1, R Oakley2 & I Ahmad1

1 Department of Anaesthesia, Guy’s and St Thomas’ NHS Foundation Trust
2 Department of Otolaryngology, Guy’s and St Thomas’ NHS Foundation Trust

**BACKGROUND**

- High pressure source ventilation requires upper airway patency to facilitate passive expiration.
- Distortions in airway anatomy, particularly in the anaesthetised patient, may make passive expiration inadequate or impossible.
- The use of high pressure source ventilation in this context risks barotrauma and cardiovascular collapse.
- Traditionally such cases have required large bore trans cricothyroid or trans tracheal catheters to allow adequate ventilation.
- The *Ventrain®* device offers an alternative means of ventilation in these challenging cases.

**CASE REPORT**

- A 58 year old gentleman with a history of squamous cell carcinoma of the right vocal cord and anterior commissure.
- Symptomatic post radiotherapy supraglottic stenosis.
- 1st attempt at laser excision abandoned due to inadequate expiration during attempted jet ventilation via both a subglottically placed catheter and the suspension laryngoscope.
- Sub epiglottic views revealed near complete obstruction in the anaesthetised patient
- A 2mm ID Cricath® cannula was inserted through the cricothyroid membrane under endoscopic guidance.
- Assisted expiration provides active suction of gas from the lungs and allows minute ventilation in excess of 6 l/min to be achieved with the additional benefit of capnometry.¹
- Awake nasal fibre optic intubation was performed under Remifentanil and Propofol sedation using standard target controlled infusion protocols.
- Grade 3 Cormack Lehane laryngoscopic views were achieved with a suspension laryngoscope.
- Laser resection of the patient’s supraglottic stenosis was carried out for approximately 1 hour.
- Ventilation was commenced with 100% oxygen using the *Ventrain®* device. O₂ flow rate 10 l/min. End expiratory CO₂ was measured. The image below shows insufflation.

End expiratory CO₂ was maintained between 5.4 and 6.4 kPa. Saturations were 100% throughout. Visible chest movements during inspiratory and expiratory phases were observed.

**DISCUSSION**

- High pressure source ventilation is an essential tool in a number of shared airway procedures. The use of high pressure sources requires upper airway patency to facilitate passive expiration and prevent gas trapping, barotrauma and cardiovascular instability.
- The *Ventrain®* device is a manually controlled, single use ventilation device that allows assisted expiration through a 2.0mm internal diameter cannula in patients with upper airway obstruction..

**REFERENCES**