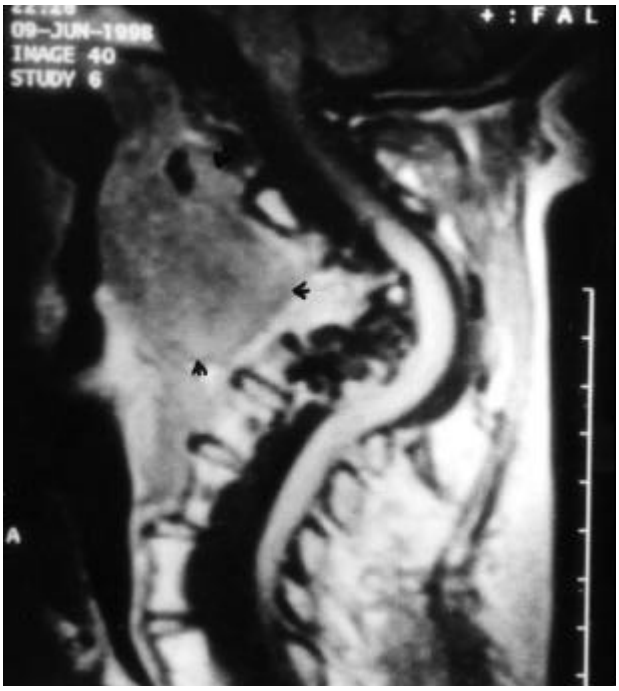

FIGURE 2 MRI showing kypho-scoliosis of cervical spine with cord compression from front due to retropharyngeal space occupying lesion. Destruction of cervical vertebral bodies is evident. The larynx and trachea are only slightly displaced ventrally.

symptoms of dyspnea or dysphagia. After investigation the patient underwent excision of the tumour under general anesthesia with tracheal intubation. No problems occurred during visualization of laryngeal opening and tracheal intubation. The operation was with minimal blood loss and a 6 cm by 4 cm by 4 cm, smooth, hypovascular mass was removed. Following tracheal extubation, airway obstruction occurred in the immediate postoperative period and the severity of stridor continued to increase. Direct laryngoscopy revealed bilaterally moving vocal cords and no edema or injury around glottis. The patient was managed with tracheal re-intubation and supported ventilation. Extubation was again tried after 12 hr with no further airway problem. Lateral x-ray of neck after extubation demonstrated normally placed trachea. The postoperative airway obstruction was probably due to tracheal angulation and realignment in the vacant space created by excision of the tumour. With time, the space filled with serous exudate and realigned tissues, but it could not be anticipated or demonstrated with the tracheal tube *in situ*.

Prabhat Tewari MD
Chandra Kant Pandey MD
Isha Tyagi MS (ENT Surgery)
Lucknow, India

References

1 *Fuse T, Yoshida S, Sakakibara A, Motoyama T.* Angiomyoma of the retropharyngeal space. J Laryngol Otol 1998; 112: 290–3.
2 *Preidler KW, Ranner G, Szolar D, Walch C, Anderhuber W.* Ultrasonography, CT and MRI of retropharyngeal gangioneuroma: a very rare neoplasm in adults. Neuroradiol 1996; 38: 378–80.
3 *Leong HK, Kwan CYW, Stanley RE, Tow S.* Malignant mesenchymoma of the retropharyngeal space. J Laryngol Otol 1993; 107: 1165–8.
4 *Yokoya S, Suda T, Koyama M, et al.* Retropharyngeal neuroblastoma causing airway obstruction in a newborn – survival with surgical treatment alone. J Paed Surg 1982; 17: 180–1.
5 *Nichol HC, Zuck D.* Difficult laryngoscopy - the "anterior" larynx and the atlanto-occipital gap. Br J Anaesth 1983; 55: 141–3.

Is a single vital capacity breath a suitable method for preoxygenation?

To the Editor:

In their recent paper,[1] Baraka *et al.* compared in ten adult patients the effect of preoxygenation by a single vital capacity breath (SVCB) with preoxygenation by three minutes of tidal volume breathing on mean arterial oxygen partial pressure (PaO_2). From the finding that PaO_2 was not different between the two groups, the authors conclude in their abstract that the single vital capacity breath technique "can rapidly provide adequate preoxygenation within 30 sec".

We agree that the study contributes interesting data. However, we feel that a problem arises from using solely PaO_2 as a marker of "adequate preoxygenation". In his recent paper in Anesthesiology, we can learn from the same author that "the time to desaturate is a more appropriate outcome measure for the efficiency of preoxygenation".[2] And he further explains that "the only reason that we perform preoxygenation maneuvers is to attempt to increase the oxygen body store and to prevent hemoglobin desaturation, and this is obviously a function of more than acute changes in PaO_2". Indeed, several studies have shown that the time to desaturation after a few vital capacity breaths is significantly shorter

compared with a longer period of tidal volume breathing of 100% oxygen (for review see references 3 and 4).

A minor problem may arise from the study protocol with two different fresh gas flows of 5 and 10 $L \cdot min^{-1}$, respectively. The lower flow was used in the standard preoxygenation group with an adult Mapelson D circuit. Although this flow is comparable to the alveolar ventilation,[5] it does not prevent nitrogen rebreathing[2,4] and thus, may not provide optimal preoxygenation.

In conclusion, the data of the study of Baraka *et al.*[1] do not show that a single vital capacity breath "can rapidly provide adequate preoxygenation within 30 sec". Although this method may improve oxygenation before a fast induction of inhalational anaesthesia as suggested by the authors, even in this setting, traditional preoxygenation methods remain a more efficient method to improve patient safety by prolonging the time to arterial desaturation.

Wolfgang Schlack MD PhD DEAA
Zoe Heck MD
Duesseldorf, Germany

References

1 *Baraka A, Haroun-Bizri S, Khoury S, Chehab IR.* Single vital capacity breath for preoxygenation. Can J Anaesth 2000; 47: 1144–6.
2 *Baraka AS, Taha SK, Aouad MT, El-Khatib MF, Kawkabani NI.* Preoxygenation: comparison of maximal breathing and tidal volume breathing techniques. Anesthesiology 1999; 91: 612–6.
3 *Campbell IT, Beatty PCW.* Monitoring preoxygenation. Br J Anaesth 1994; 72: 3–4.
4 *Anonymous.* Preoxygenation: physiology and practice. Lancet 1992; 339: 31–2.
5 *Baraka A.* PCO_2 control by fresh gas flow during controlled ventilation with a semi-open circuit. Br J Anaesth 1969; 41: 527–30.

REPLY:

Thank you for referring to me the constructive comments of Schlack and Heck concerning our report "Single vital capacity breath for preoxygenation".[1] The report shows that the single vital capacity breath (SVCB) technique, which has been recommended for fast induction of inhalation anesthesia, can also result in rapid increase of arterial PO_2.

The main oxygen store exists in the functional residual capacity of lung (FRC), and hence all techniques of preoxygenation are based on denitrogenation of FRC, using 100% oxygen. The arterial PO_2 rapidly equilibrates with the alveolar PO_2, and can be taken as a marker for the degree of alveolar denitrogenation.

The alveolar and arterial oxygen stores are supplemented by the oxygen tissue stores which need extra time of preoxygenation. Thus, the subsequent desaturation time may differ despite similar PaO_2 values.[2] It is expected that preoxygenation by the traditional tidal volume breathing for three minutes or by the eight deep breaths for 60 sec[2] can delay desaturation more than preoxygenation by the four deep breaths for 30 sec[3] or by the SVCB.[1]

The traditional or the eight deep breaths techniques are preferred whenever prolonged apnea is expected in patients with difficult airway, or whenever FRC is decreased in the pregnant or obese patients, and in patients with pulmonary dysfunction.

SVCB after forced exhalation can be used for rapid preoxygenation in patients with normal airway and FRC, particularly in those who cannot tolerate a tight-fitting face mask for a long period. Forced exhalation to residual volume may be used to enhance denitrogenation of FRC not only prior to the SVCB technique, but also before other techniques of preoxygenation.

Anis Baraka MD FRCA
Beirut, Lebanon

References

1 *Baraka A, Haroun-Bizri S, Khoury S, Chehab IR.* Single vital capacity breath for preoxygenation. Can J Anesth 2000; 47: 1144–6.
2 *Baraka AS, Taha SK, Aouad MT, El-Khatib MF, Kawkabani NI.* Preoxygenation: Comparison of maximal breathing and tidal volume breathing techniques. Anesthesiology 1999; 91: 612–6.
3 *Gold M, Duarte J, Muravchik S.* Arterial oxygenation in conscious patients after 5 minutes and after 30 seconds of oxygen breathing. Anesth Analg 1981; 60: 313–5.