

## Use of ETVIEW Tracheoscopic Ventilation Tube® in airway management of a patient with tracheal injury

T. UMUTOGLU, M. BAKAN, U. TOPUZ, S. ALVER, E. OZTURK

Department of Anesthesiology and Reanimation, Faculty of Medicine, Bezmialem Vakif University,

Dear Editor,

Iatrogenic tracheobronchial injuries are fatal complications requiring immediate diagnosis and treatment. Unintentional one sided intubation, endotracheal tube cuff over-inflation, direct trauma with guides or boogie's, double-lumen tube employment, tube replacement without cuff deflation and coughing against closed or blocked ventilation circuits are the possible causes.<sup>1,2</sup> Emergency or difficult intubation also increases the risk of tracheal wall injuries.<sup>3</sup>

The ETVIEW Tracheoscopic Ventilation Tube® (ETVIEW TVT®, Misgav, Israel) is a standard endotracheal tube connected with an embedded miniature video camera, a light source and an irrigation port.<sup>4</sup> It enables real time video images from tracheal lumen to verify the correct placement of the tube and view the pathologies in the tracheal lumen. We want to report, successful airway management with ETVIEW TVT® in a patient with iatrogenic tracheal injury. Written informed consent was obtained from her relatives.

An 87-year-old woman who had been under observation for one day at the emergency unit suffered from cardiac arrest. During the cardiopulmonary resuscitation the patient was intubated and manually ventilated with a self-inflated bag. In a couple of minutes spontaneous circulation was restored, but SpO<sub>2</sub> was below 80% despite pure oxygen and high inspiratory pressures and massive subcutaneous emphysema was observed. Computerized tomography imaging revealed a large full-thickness tracheobronchial injury due to over inflation of the tracheal cuff, pneumothorax at the right lung, and massive subcutaneous emphysema. Urgent fiber-optic video bronchoscopy and esophagoscopy revealed a huge laceration at the posterior wall of the trachea beginning just under the vocal cords and ending 1 cm over the tracheal carina. During fiber-optic bronchoscopy, severe desaturation occurred due to the impairment in mechanical ventilation. Patient was immediately transferred to the operating room, for endobronchial intubation. The tube could not be introduced over the fiber-optic endoscope easily and for the risk of expanding the laceration, patient was reintubated with an ETVIEW TVT® no. 7.0 (ID). Injury at the

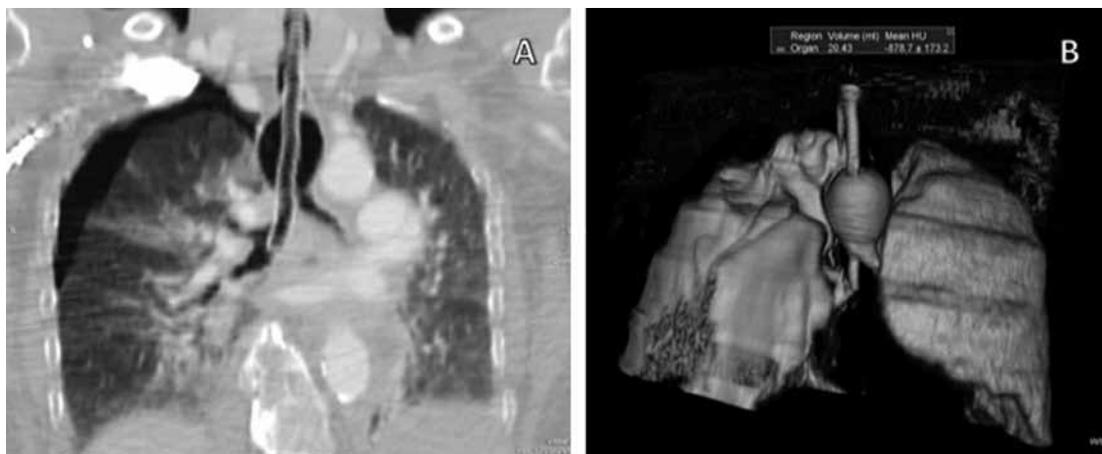


Figure 1.—Computed tomographic scans of thorax. A) Coronal view; B) 3D view.

trachea was displayed, the tear bypassed and the endotracheal tube placed into the left bronchus. Shortly after confirmation of the adequate ventilation, the patient was immediately positioned and the laceration repaired with a right thoracothomic approach. During the operation the position of the tube was confirmed and the airway was monitored continuously. After tracheal repair ETView TVT® was repositioned back to the tracheal lumen under real time video imaging and the repair was confirmed. Following the operation patient was transferred to intensive care unit for further respiratory support.

ETView TVT® was used successfully for difficult airway management, to provide continuous airway visualization for early diagnosis of intraoperative tube displacement and with bronchial blockers for lung isolation.<sup>4,5</sup> In the present case, to ensure one-lung ventilation for right thoracotomy approach, using a double-lumen tube might enlarge the laceration. Also, a bronchial-blocker would be useless, as the laceration had to be by-passed. Using a standard endotracheal tube with the assistance of a fiber-optic bronchoscope might have had a more deteriorating effect on ventilation for our patient.

In conclusion, ETView TVT® might be a useful tool for

airway management of tracheal injuries in anesthesiologists' armamentarium.

### References

1. Satyadas T, Nasir N, Erel E, Mudan SS. Iatrogenic tracheal rupture: a novel approach to repair and a review of the literature. *J Trauma* 2003;54:369-71.
2. Deja M, Menk M, Heidenhain C, Spies CD, Heymann A, Weidemann H *et al.* Strategies for diagnosis and treatment of iatrogenic tracheal ruptures. *Minerva Anestesiol* 2011;77:1155-66.
3. Mullan GP, Georgalas C, Arora A, Narula A. Conservative management of a major post-intubation tracheal injury and review of current management. *Eur Arch Otorhinolaryngol* 2007;264:685-8.
4. Heitz JW, Shum PP, Grunwald Z. Use of a tracheoscopic ventilation tube for endotracheal intubation in the difficult airway. *J Clin Anesth* 2011;23:403-6.
5. Giglio M, Oreste D, Oreste N. Usefulness of ETView TVT endotracheal tube for correct positioning of bronchial blockers in left lobectomy: an easy and safe combination. *Minerva Anestesiol* 2009;75(Suppl.1 to No:7-8):1-4.

*Conflicts of interest.*—The authors certify that there is no conflict of interest with any financial organization regarding the material discussed in the manuscript.

Received on June 4, 2013. - Accepted for publication on October 10, 2013.

Corresponding author: M. Bakan, Bezmialem Vakıf Üniversitesi Tıp Fakültesi Hastanesi, Vatan cad., Fatih, 34093, Istanbul, Turkey. E-mail: mefkur@yahoo.com