

# TOTAL AIRWAY OBSTRUCTION DURING TRACHEOSTOMY IN A PATIENT WITH MULTIPLE TRACHEAL STENOSIS

## - A Case Report -

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### Case Report

Complete airway obstruction can develop during surgical tracheostomy for tracheal stenosis.

A 29-yr-old woman weighing 90 kg, having a history of tracheal stenosis, was admitted with severe dyspnea. Two weeks earlier, she had been hospitalized in another hospital for organophosphorus intoxication and she was intubated for several days. Two days after discharge, she developed difficult breathing and hoarseness and was admitted to our hospital for further evaluation. A CT scan followed by a flexible bronchoscopy, both, revealed tracheal stenosis at two levels; the first was about 1 cm below the vocal cords and the second 2 cm above the carina. Oxygen and steroid therapy were instituted. During the next 24 hours progressive upper airway compromise developed. The patient became severely dyspneic and stridulous using accessory muscles of respiration. The patient was taken to the operating room for an emergent tracheostomy to improve ventilation. With the patient breathing spontaneously 100% oxygen, routine anesthetic monitoring was commenced. Pulse oximetry indicated a SpO<sub>2</sub> of 80%. Arterial blood pressure and heart rate were 156/85 mmHg and 110 beats/min

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respectively. Surgery was started under local anesthesia. As a result of the patient's obesity, the shortness of her neck and the agitation; the tracheostomy was performed under difficult conditions. During surgery, the patient became more dyspneic and cyanosed when the surgeon reached the trachea and SpO<sub>2</sub> dropped below 70%. Jet ventilation was commenced via a 16 Gauge catheter in the trachea to improve oxygenation, but failed to ventilate the patient. The trachea was opened surgically and 7.0 mm cuffed tracheostomy tube was inserted through the tracheostomy orifice. Ventilation remained impossible and a sudden loss of consciousness associated with bradycardia that quickly progressed to cardiac arrest, developed. Cardiac resuscitation was initiated and restored the patient to sinus tachycardia with undetectable blood pressure and non recordable SpO<sub>2</sub>. After several trials of surgical dilatation of the lower stenosis, a 5.0-wire-reinforced endotracheal tube successfully crossed the lower stenosis of the trachea and ventilation became possible with FIO<sub>2</sub> 1.0. At this time, blood pressure was restored (145/99 mmHg) and SpO<sub>2</sub> increased to 90%. Auscultation of the lung revealed bilateral inspiratory rales. The patient was transferred to the intensive care unit. Chest radiograph showed a bilateral pulmonary edema. The patient remained unresponsive and died 24h after surgery.

Tracheal stenosis has been and remains one of the most vexing problems in the field of head and neck surgery. Postintubation tracheal stenosis is a clinical problem caused by ischemia of the tracheal mucosa that may progress to the destruction of cartilaginous rings and subsequent circumferential constricting scar formation. Infection and systemic hypotension may contribute to events that culminate in tracheal stenosis. Symptoms may not develop until several days after extubation.

In our case, we postulated that subglottic stenosis resulted from prolonged intubation and the second lower stenosis might be the result of infection, tracheal edema or chemical irritation from possible aspiration during the organophosphorus ingestion.

We speculate that complete airway obstruction which developed during tracheostomy, might be the result of surgical mobilization of the

trachea and/or the rapid development of soft tissue swelling in the stenotic sites during surgery. In addition, corticosteroid therapy can lead to increased tissue friability.

Several methods (including jet ventilation) failed to restore ventilation and rescue this young patient. Obesity, short neck and tracheal stenosis with multiple levels might all predict the possibility of total airway obstruction during tracheostomy procedure.

In conclusion, one should not consider tracheostomy as a secure procedure to improve ventilation when it is performed between two levels of stenosis. Other suggestive methods (temporary cardiopulmonary bypass via femoro-femoral cannulations) can be life saving allowing gas exchange even if the trachea becomes completely occluded<sup>1</sup>.

**Key words:** Airways obstruction; Tracheal stenosis; Tracheostomy. Support was provided solely from departmental sources.

## References

1. CHIU CL, THE BT, WANG CY: Temporary cardiopulmonary bypass and isolated lung ventilation for tracheal stenosis and reconstruction. *Br J Anaesth*; 91:742-4, No. 2003.

