

# Airway management of a rare huge-size supraglottic mass

*Haitham A. Abou Zeid, MD, MSc, Samer A. Arab, AB, MSc, Abdel Mohsen A. Al-Ghamdi, MD, DA (England),  
Abdel-Aziz A. Al-Qurain, MD, FACP, Khalid M. Mokhazy, MD, MSc.*

## ABSTRACT

Laser excision of a huge-sized supraglottic mass nearly obstructing the airway passage is a real challenge to anesthesiologists. Upper airway obstruction due to neoplasm in supraglottic region, is traditionally managed by preoperative tracheostomy, however, such a common procedure can potentially have an impact on long-term outcome. A 26-year-old patient presented with dysphagia caused by left cystic vallecular synovial sarcoma. The airway was successfully secured via fiberoptic bronchoscopy, followed by excision of the supraglottic tumor with CO<sub>2</sub> laser surgery. Tracheostomy was not required. The patient was discharged from the hospital on the 4th day of surgery. This case, highlights the possibility to secure the airway passage without performing preoperative tracheostomy resulting in good outcome and short hospital stay.

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The airway management of patients with supraglottic masses and vallecular cysts is challenging to anesthesiologists with a high risk of total airway obstruction. The airway, in such patients, is traditionally managed by preoperative tracheostomy. This common procedure can potentially have an impact on the long-term outcome, with no prospect of reversal in the immediate future and with tumor implantation into the tracheostomized wound leading to peristomal recurrence. Here, we report a case of huge-size synovial sarcoma of the larynx in which tracheostomy was not required, and the airway was successfully secured and the trachea intubated via fiberoptic bronchoscopy, followed by excision of the supraglottic tumor with carbon dioxide (CO<sub>2</sub>) laser surgery.

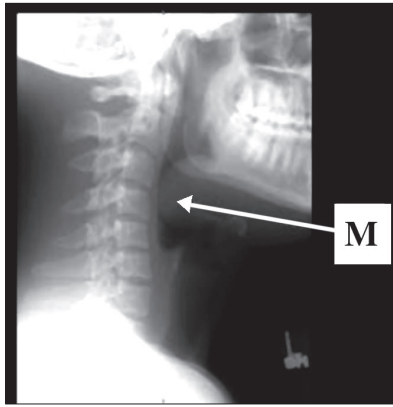
**Case Report.** A 26-year-old Saudi man presented to the Ear, Nose, Throat outpatient clinic of our

hospital, with one year history of slowly progressive dysphagia and voice change. At the beginning, he started to complain of mild voice change, which became moderate to severe and steadily progressed. Later, he began to have progressive dysphagia to fluids and solid food. He denied any history of cough, hemoptysis or any other respiratory symptoms or medical illness. There was no earache, fever or night sweating. Clinical examination revealed a mass measuring approximately 4 × 5 cm, pink in color with intact covering mucosa, not pulsating and obstructing the airway passage. The lateral view of cervical x-ray and magnetic resonance imaging (MRI), study revealed a huge mass extending from the left vallecular region to the posterior pharyngeal wall, leaving a narrow slot for air passage with an acute angled larynx (**Figure 1**). Chest x-ray and the laboratory investigations were all within normal limits. Based on the clinical and radiological investigations including

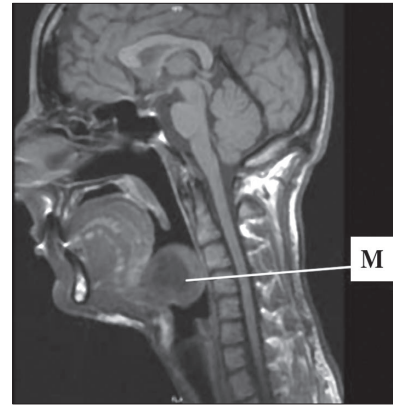
From the Departments of Anesthesiology (Abou Zeid, Arab, Al-Ghamdi), Internal Medicine (Al-Qurain) and Radiology (Mokhazy), King Fahd Hospital of University, Al-Khobar, Eastern Province, Kingdom of Saudi Arabia.

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Address correspondence and reprint request to: Dr. Haitham A. Abou Zeid, PO Box 40081, Al-Khobar 31952, Kingdom of Saudi Arabia. Tel. +966 (3) 8945677 Ext. 2022. Fax. +966 (3) 8976790. E-mail: haithamabouzeid@hotmail.com



**Figure 1** - Lateral view x-ray shows the supraglottic mass (M).



**Figure 2** -Magnetic resonance imaging; sagittal T1, the tumor (M) obstructs the airway.

the MRI findings, the working diagnosis was benign structure, such as a cyst, versus a malignant mass (**Figure 2**). The plan was to marsupialize the cyst using microscopic CO<sub>2</sub> laser surgery. After obtaining a written informed consent, he was scheduled for surgical intervention.

In the operating room, he was premedicated with intravenous injection of midazolam 2 mg, glycopyrrolate 0.4 mg, ranitidine 50 mg, and metoclopramide 10 mg, 20 minutes before starting on the anesthesia. Oxygen nasal catheter with 4 L/min was connected. The airway was prepared initially by Xylocaine 2% 5 ml nebulizer. The Xylocaine 10% spray, Xylocaine viscous gargle, and superior laryngeal nerve block with 1.5 ml bupivacaine 0.5% on each side were added to block the whole area above the vocal cords. Transtracheal local injection was avoided. A well lubricated pediatric size fiberoptic bronchoscope (FOB) 3.1 mm ID with 5.5 mm ID laser resistant endotracheal tube (ETT) mounted on, was passed successfully under the huge mass. At the vocal cords 4 ml of Xylocaine 2% were flashed to block the cords and the underlying area. The FOB and the mounted ETT were passed easily through the trachea. The laser-resistant ETT was pushed forward taking the FOB as a stylet. The position of the laser-resistant ETT was confirmed by the FOB itself and the capnography tracing. He was stable throughout the intubation procedure. An ENT surgeon was ready at any moment for immediate tracheostomy to secure the airway if the situation needs rapid intervention. Subsequently, he was connected to anesthesia machine (Datex-Ohmeda S/5, Helsinki, Finland), by which Sevoflurane 2% and O<sub>2</sub>:N<sub>2</sub>O (1:1 ratio) were administered. Fentanyl 1 µg/kg and rocuronium 0.45 mg/kg were used as required. The CO<sub>2</sub>- laser machine

(Sharplan 105 S, USA; CO<sub>2</sub>, He-Ne laser medium) connected to Leica microscope, USA was used in the surgical intervention. Due to the solid and wide base mass bipolar diathermy was added to secure meticulous hemostasis. After the surgery, the laser resistant tube was replaced by an oral ordinary ETT 7.5 mm ID. He was transferred to the intensive care unit ventilated and sedated by intravenous infusion midazolam 4 mg/h and morphine 4 mg/h. Since the repeated blood gas analysis were within normal level and the direct laryngoscopy did not show any edema in the surgical field, he was extubated one day after the surgery.

Histopathological evaluation of the specimen was consistent with synovial sarcoma. Based on that, he was referred to the oncology center in King Faisal Special Hospital for further management and he was discharged on the 4th day postoperatively.

**Discussion.** Synovial sarcoma is a rare soft tissue tumor, which commonly occurs in adolescents and young adults.<sup>1</sup> The head and neck is a rare location (3-10%) and only approximately 10 cases with laryngeal localization had been reported in the world literature.<sup>2,3</sup> Patients with a mass occupying and obstructing the entire supraglottic area, present an extreme difficulty in securing the airway for anesthesiologists. Tracheostomy was traditionally the mainstay for securing the airway in patients with such a mass.<sup>4</sup> The safe approach in such patients is to secure the airway, while the patient is awake using fiberoptic bronchoscopy to intubate the trachea. This procedure requires skill and good experience. We have encountered several problems in intubation of the trachea via FOB, due to the following: first, the supraglottic mass occupied almost all supraglottic

area leaving a small slot for manipulation (**Figures 1 & 2**); second, the mass caused severe distortion of the larynx and pushed the glottis to an unusually acute angle and creating an awkward passage for the FOB and recognition of the larynx was tricky and difficult; and third, the use of ordinary or armored ETT mounted on FOB may not cope with the laser surgery. However, we were to deal with these obstacles and lastly to intubate the trachea. Failure of FOB guided placement of ETT despite successful tracheal placement of FOB has been documented,<sup>5</sup> possibly due to the use of pediatric FOB, which was too thin to act as a good stylet.

In our case, awake technique with local anesthesia to the airway was selected although the inhalational approach has been recommended for such patients. Hypnotic agents as well as analgesics, amnestics and muscle relaxants will obtund the protective airway reflexes and thwart oxygenation and ventilation.<sup>6</sup> A “ball-valve” obstruction in an anesthetized patient with supraglottic mass has been reported.<sup>7</sup> In another incident, a total airway obstruction has been reported during local anesthesia in a “non-sedated” patient with a compromised airway.<sup>8</sup> Using the nasal route will make the intubation process more easier, however, the oral route was chosen to avoid aggressive trauma and bleeding from the nose and nasal mucosa by the rough surface of the metal-like laser-resistant ETT. Preoperative tracheostomy should be avoided since it has no prospect of a reversal in immediate future and can have a profound impact on patient’s quality of life and psychological well being.<sup>4</sup> Paleri et al<sup>9</sup> reported the use of a laser debulking, which demands the highest level of cooperation between surgeons and anesthetists as a viable alternative to tracheostomy in patients with malignant upper airway obstruction. Using a big needle for aspiration of the fluid of the mass was reported by Cheng et al<sup>10</sup> to facilitate visualization of the vocal cords. However, we did not prefer or even support this hazardous approach due to risk of pulmonary aspiration, increase recurrence rate

and difficulty in identification of the cyst margin on subsequent surgery.

In conclusion, airway management of supraglottic mass was traditionally secured via tracheostomy. Fiberoptic bronchoscopy is a safe technique to secure the airway and facilitate the intubation of the trachea resulting in an excellent outcome and short hospital stay.

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