

A New Method of Airway Management in Airway Tumor Resection: A Case Report

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Abstract

Tracheal tumor is a rare but life-threatening condition that can cause obstruction of the airway. Primary tumors of the tracheal, mostly malignant, are rare, accounting for fewer than 0.1% of all tumors [1]. Surgical resection is the major option that has the potential to cure all patients with benign and low-grade tumors and most patients with malignant tracheal tumors [2,4]. Airway Management of tracheal tumors is very challenging during surgical resection. We present a rare case of an 72-year-old female patient with a tracheal tumor. We devised a new method for airway management of the tracheal. Because management of her airway and the tracheal tumor by conventional methods was impossible. When management of a patient's airway and tracheal tumor are impossible by conventional methods, this technique may be very useful.

Keywords: *Airway Management; Tracheal Tumor; Resection*

Introduction

Tracheal tumor is a rare but life-threatening condition due to obstruction of the airway [1]. Airway management of a tracheal tumor is very challenging during surgical resection. We successfully resected the tracheal tumor with new methods of airway management without any complications.

Case reports

A 72-year-old woman presented to our hospital with a 3-month history of dyspnea at rest and a productive cough. Chest computed tomography(CT) showed a space-occupying lesion inside the lower tracheal (Figure 1). Low-grade malignant tumor or benign lesion was considered. The mass was sized 0.5 cm ×0.8 cm× 0.6 cm and located at the upper of the tracheal carina (Figure 1). Plain CT scans of head and abdominal organs did not find any suspicious lesion. Pulmonary function tests showed MVV:60.38L/min (76.4%), FEV1:1.65(89.7%) and the other pulmonary ventilation function was basically normal. The general anesthesia was induction by Sufentanil (20 µg) and propofol (100 mg), Muscle relaxant rocuronium 50 mg was applied. After the anesthesia, the patient was under endotracheal intubation. Ventilation with tracheal intubation was applied when spontaneous breathing stopped. Tracheal intubation was completed under the guidance of Glidescope. The ventilation was successful and oral tracheal intubation with a flexible endotracheal tube having an internal diameter of 6.5 mm was successful. The distance from the depth of the tracheal tube to the central incisors was 22 cm. The tracheal tube was connected with the anesthesia ventilator for mechanical ventilation. The oxygen concentration was adjusted according to blood oxygen saturation to maintain the blood oxygen saturation above 95%. During the surgery, anesthesia was maintained using remifentanil (0.03 - 0.05 µg/kg per min) and propofol (0.2 mg/kg per min). The depth of anesthesia was measured using the EEG bispectral index during the surgery. The patient received mechanical ventilation and then underwent surgery. Intraoperatively, the tumor was found at the

upper of the tracheal carina about 1 cm. Then we withdraw the endotracheal tube (ID 6.5#), slow exit the end of endotracheal tube from a depth of 22 cm away from the central incisors to 15 cm from the central incisors. To cut off the distal end of the tracheal segment where the airway tumor is located, and then insert another sterile endotracheal tube (ID 5.5#) into the left main bronchus through the operative field of vision to maintain ventilation (Figure 2), and then cut off the trachea at the upper part of the tumor. The distal end of the trachea and the proximal end of the anastomosis, when anastomosis to the tracheal diameter of 2/3, removed the trachea catheter through the surgical field of vision from the left main bronchus, continue to suture the remaining part of the trachea. Then insert the former tracheal tube (ID 6.5#) to the tracheal anastomosis depth. Injection of a small amount of saline from mediastinal anastomotic around, then pressurized to tracheal inflatable, to check whether the anastomotic leakage or not. After the surgery, the patient was sent to the intensive care unit with strict monitoring.



Figure 1: Chest computed tomography(CT) showed a space-occupying lesion inside the lower tracheal.

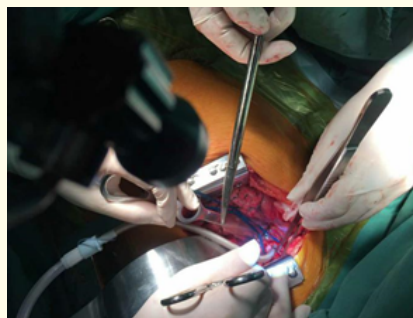


Figure 2: Insert another sterile endotracheal tube(ID5.5#) to left main bronchus through the operative field of vision to maintain ventilation.

Discussion

Tracheal tumor is a relatively uncommon tumor of respiratory system [1]. The common symptoms of tracheal tumors include cough, coughing up blood, shortness of breath. When the tumor becomes larger, the patient may suffer from difficulty breathing or even asphyxia [5,6]. Surgical resection is the best treatment for primary tracheal tumors, because it is the only treatment modality that provides the chance of cure [3]. Therefore, patients with primary tracheal tumors should be properly evaluated before the surgery. Examinations include the cardiac function test, pulmonary function tests, chest computed tomography(CT), and the size and position of tumor. Although resection greatly improves prognosis, but the anesthetic management of patients with tracheal tumors is challenging. Various anesthetic techniques are available to patients with tracheal tumors. According to our experience, conventional mechanical ventilation is the most ideal way to do some ventilation, carinal resection of the tumor, especially just right main bronchus in the proximal part of the tumor, can carry out conventional ventilation using a double lumen. In this case, after the trachea was cut off, a sterile single - lumen catheter (5.5#) was handed to the surgeon and inserted into the distal bronchus. The advantage of this method is that the mechanical ventilation is a closed loop, which can monitor the volume of ventilation, airway pressure, and exhaled carbon dioxide concentration. But the deficiency is that the tracheal catheter may affect the operation, especially in the procedure of anastomosis. The use of intermittent ventilation during tracheal anastomosis, and mix with application of pure oxygen to ensure sufficient oxygen containing functional residual [5]. Because of pulling out the tracheal catheter to finish tracheal anastomosis with non-ventilation time, the proposal to allow most long time is 3 minutes, and then during the period of non-mechanical ventilation, should close monitoring of vital signs, consistent continue the implementation in mode of mechanical ventilation [6].

Conclusion

In conclusion, we document a case of a successful airway management in a patient undergoing surgical resection of a large, high tracheal tumor causing severe tracheal stenosis. Our case suggests that tracheal intubation can be performed directly in patients with a large, high tracheal tumor causing severe tracheal stenosis.

Disclosure

Written informed consent was obtained from the patient upon discharge for publication of this case report and all accompanying images. The authors report no conflict of interest in this work.

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