Anterior Mediastinal Mass in a Patient Requiring Lung Isolation

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Introduction

A patient with an anterior mediastinal mass poses numerous challenges to an anesthesiologist, the major concerns being pulmonary or cardiac collapse on induction of anesthesia. Preoperative evaluation of the chest x-ray as well as the CT scan is valuable in assessing potential problems regarding management of this type of airway. An awake fiberoptic intubation is the preferred method of securing the airway.

Case Report

Mask ventilation was easy and the patient was intubated on the first attempt with a size 7 Univent endotracheal tube. Tube placement was confirmed and the patient was placed on the ventilator. Once long acting muscle relaxants were administered the patient began to desaturate. Fiberoptic bronchoscopy confirmed proper endotracheal tube placement and a patent bronchial tree. When we isolated the right lung, oxygen saturation dropped to 85%, prompting immediate resumption of two-lung ventilation with a great deal of difficulty.

We decided to alternate between one- and two-lung ventilation and modify the table position to relieve airway compression. Lung isolation was required to allow the surgeon access to the mass. The patient had a median sternotomy followed by resection of the anterior mediastinal thymic mass, a large right pleural/diaphragmatic mass, drainage of a right pleural effusion, and right chest pleurodysis.

Postoperative Management

At the end of the procedure, the Univent tube was replaced via tube exchanger with a regular 7.0 mm endotracheal tube and the patient was transported to the surgical intensive care unit. She was extubated the following day and discharged on postoperative day 5. The pathology report described the mass as a type B2 thymoma weighing 359 g. The right diaphragmatic mass and pleural nodules were diagnosed as disseminated thymoma.

Discussion

A detailed preoperative evaluation and risk stratification of all patients with anterior mediastinal masses are essential irrespective of the presence or absence of symptoms. Patients may be asymptomatic and show no evidence of airway compression on chest x-ray. Despite the uneventful anesthesia induction, we had difficulty ventilating the patient once she was paralyzed, as the mass was compressing the major bronchi. Although it may be argued that spontaneous respiration is essential to maintain negative intrathoracic pressure and prevent compression of anterior mediastinal structures, in this case we needed paralysis to enable lung isolation. Radiation therapy is recommended to reduce tumor size in symptomatic patients. The CT scan showed extrinsic compression of the right main bronchus but a pulmonary flow volume loop might have revealed a significant decrease in peak flow rate with the patient in the supine position, consistent with intrathoracic airway obstruction, which would have alerted us to the intraoperative difficulties. Changing the position of the table so that the tumor-related compression pressure was the lowest, thereby immediately minimizing the airway occlusion was our best option. Anesthesiologists should be mindful of and anticipate these challenges and plan ways to work around these issues with the surgeon. Spontaneous ventilation is the better option, but if paralysis is essential, anticipating the problem and planning ahead helps.

References