

Airway Obstruction Associated with Induction of General Anesthesia in a Patient with Mediastinal Tumor

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Large mediastinal tumors may cause obstruction of the trachea and main bronchi. The following case emphasizes the anesthetic hazards of administering anesthesia to patients with mediastinal tumors.

Report of a Case

A 26-year-old female at 27 weeks' gestation was admitted complaining of severe cough and her edematous face. Chest roentgenogram revealed a mass in the anterior mediastinum extending to the right lung (fig. 1).

Cough was dry and increased markedly when supine, so she slept in the sitting or lateral position. On physical examination she had moderate facial edema, and breath sounds were clear but mildly decreased over the right upper thorax.

Computerized tomography of the mediastinum in the supine position showed the mass compressing the trachea and bilateral main bronchi as shown in figure 2-A and B. Bronchoscopy could not be performed for her severe cough. The superior vena cava syndrome was confirmed by venography (fig. 3). And the biopsy under local anesthesia revealed the malignant lymphoma.

Radiotherapy was intended, but not performed considering the influence on the fetus, until the patient was scheduled to undergo cesarean section at 30 weeks' gestation.

Atropine, 0.5 mg, was given intramuscularly in 30 min prior to the induction of anesthesia. After enough preoxygenation, 300 mg of thiopental and 60 mg of succinylcholine chloride were given intravenously. Immediately after unconsciousness and apnea developed, the trachea was intubated under cricoid pressure without assisted ventilation (crash induction). As soon as the patient was intubated with a 7.5 mm internal diameter cuffed tube, surgeons started operation. At that time, breath sounds were diminished over the right lung at first, and controlled ventilation became almost impossible about 1 min later. The cuff was deflated, but no air entry was obtained. The endotracheal tube was removed immediately but it had no abnormality, and ventilation via a mask was also unsuccessful. After additional administration of 40 mg of the succinylcholine, the trachea was reintubated with 7.0 mm internal diameter tube. The tube did not advance farther than 23 cm from incisors with the firm resistance.

The patient became extremely cyanotic and premature ventricular contraction was seen frequently on ECG monitor. A 1410g female infant was delivered about 5 min after the onset of the airway obstruction with Apgar scores of 6 and 9 at one and five minutes, respectively.

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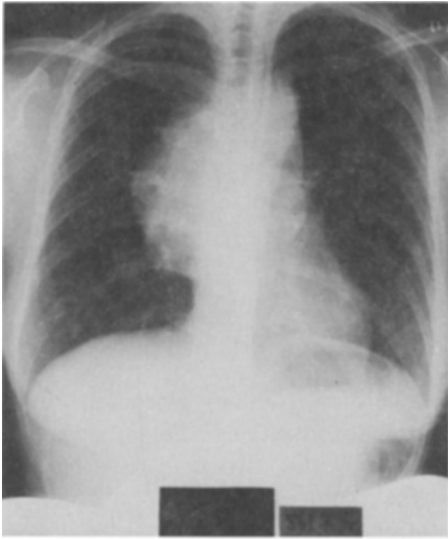


Fig. 1. Chest roentgenogram showing a large mediastinal tumor.

About 15 min after the onset of the airway obstruction, air entry was obtained somewhat in an attempt to lift up the intubated patient's jaw and to keep her neck extremely extended. Airway obstruction was diminished furthermore after spontaneous ventilation returned. Fiberoptic bronchoscopy was performed. Immediately above the carina, the trachea was compressed anteroposteriorly and slit-like. The compression was more severe in the supine position than in the left lateral position. The patient was extubated in the left lateral position after the operation was over. No airway difficulty was encountered afterward unless supine.

She was underwent radiation for 4 weeks. The mass had decreased in size on chest roentgenogram and she has been able to keep the supine position without cough, having lost her facial edema. Neurological defect was found neither in her nor in her infant.

Discussion

Airway obstruction associated with induction of general anesthesia in patients with mediastinal masses is well recognized¹⁻⁵. The mechanism of the obstruction in these cases is considered

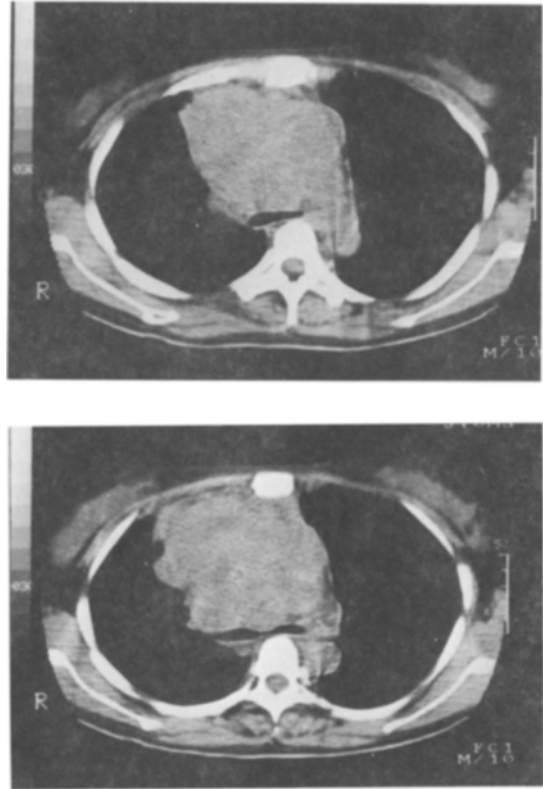


Fig. 2-A, B. Computerized tomography of the mediastinum in the supine position showing the mass compressing the trachea (A) and bilateral main bronchi (B).

compression of the trachea by the tumor mass.

Our patient had many conditions in common with these cases. First, she had had some predictive symptoms. Keon⁶ suggested that dyspnea and intolerance of the supine position is a hazardous symptom. Mackie et al¹ described airway obstruction in patients with mediastinal masses diagnosed superior vena cava syndrome. Second, the airway obstruction may be diminished in a certain position. Either right or left lateral position may succeed^{2,3}. Finally, airway obstruction was diminished after spontaneous ventilation returned^{1,4}. It is conceivable the compromised airway in these patients remained patent only during spontaneous ventilation. Once the skeletal muscles were paralyzed and the

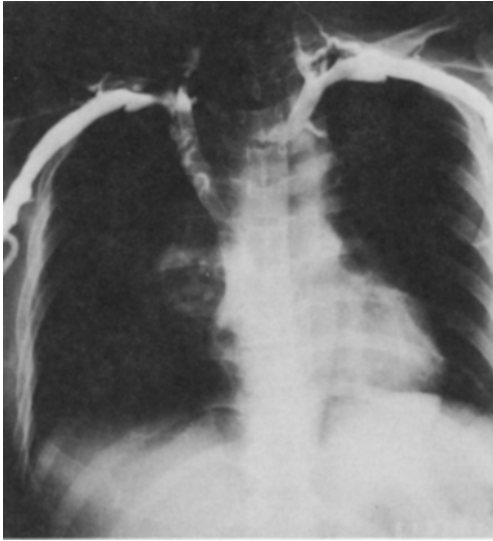


Fig. 3. Venography of the superior vena cava. Retention of contrast media indicating superior vena cava syndrome is demonstrated.

smooth muscles were relaxed during general anesthesia, airway obstruction occurred⁴.

In this case, improvement of airway obstruction in the intubated patient was obtained by extension of the head and anterior displacement of the mandible. This maneuver known as the head tilt-jaw thrust method might pull indirectly the tumor and open the compressed trachea and main bronchi.

Prior to general anesthesia of the patients with anterior mediastinal masses, the condition of their airway should be evaluate in an organized way that emphasizes the dynamic nature of the disease process⁶. Some authors^{1,4-6} emphasize the importance of maintaining spontaneous ventilation during induction of anesthesia. Bittar⁴ and Piro et al.⁷ recommend radiation to mediastinal tumors in patients with Hodgkin's disease prior to endotracheal anesthesia to prevent life-threatening airway complications.

In this case, however, preoperative radiotherapy was avoided because of her gestation. To make the matter worse, inhaled anesthesia and neuroleptanesthesia suitable for maintaining spontaneous

ventilation are undesirable for the cesarean section because of relaxation of the smooth muscle of the uterus and drug depression of the fetus.

We should have chosen spinal anesthesia or epidural anesthesia in the left lateral position, in spite of the possibility of the unexpected complication by her persistent cough.

Summary

The case of airway obstruction associated with induction of general anesthesia in a patient with mediastinal tumor is reported. This case emphasizes that the head tilt-jaw thrust method may improve airway obstruction due to mediastinal tumor even in the intubated patient.

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