A Nearly Fatal Tracheal Obstruction Resulting From a Transtracheal Oxygen Catheter*

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In a patient with a transtracheal oxygen catheter (ITO,C), a nearly fatal complication occurred due to the formation of a mucous plug on the tip, which almost totally obstructed the tracheal lumen. To our knowledge, this complication has not been reported before with the use of this type of transtracheal oxygen catheter. (Chest 1993; 104:1634-35)

Long-term continuous oxygen therapy in patients with hypoxemia due to chronic obstructive pulmonary disease significantly improves expectancy of life. The nasal prong, although frequently used to deliver oxygen, is rather ineffective because of spilling into the air. Because domiciliary oxygen therapy either involves an immobile oxygen concentrator or compressed oxygen cylinders, which are frequently too heavy to carry, patients using this therapy are often confined to their homes. Transtracheal oxygen catheters in combination with the use of low-weight fluid oxygen cylinders are designed to extend the patients' mobility. There have been several reports about the beneficial effects of these transtracheal oxygen catheters. They offer a 50 percent or greater saving in oxygen usage and aesthetic benefits leading to increased compliance. The reported complications are usually mild and only temporal. These include wound infections, subcutaneous emphysema, coughing of the catheter into the upper airways, and obstruction of the catheter with mucus. We report a case of a nearly fatal complication.

CASE REPORT

A 69-year-old man was admitted to our hospital with severe dyspnea due to an acute exacerbation of chronic obstructive pulmonary disease that had not been diagnosed previously. He appeared extremely dyspneic and cyanotic. Physical examination revealed a hyperresonant percussion of the chest with diminished vesicular breath sounds and a prolonged expiration. His arterial oxygen tension at the time of hospital admission was 6.3 kPa (46 mm Hg). A flow of 5 L/min of 100 percent oxygen through a nasal catheter with the tip positioned in the nasopharynx was needed to maintain the arterial oxygen tension above 8.2 kPa (60 mm Hg).

After several weeks of optimizing his pulmonary and general condition, he continued to have a persistent cough productive of mucoid sputum. He remained dependent on 5 L/min of oxygen. Once the patient consented, a transtracheal oxygen catheter (ITO,C) was inserted using the techniques described in the manufacturer's manual. Subsequently, the oxygen demand fell with approximately 50 percent. Throughout the whole period the patient carried this catheter, he performed the maintenance procedures according to the manufacturer's guidelines. In the period following the installation of the catheter, the patient had to be treated three times for recurrent bronchial infections. Ten days after the installation, severe subcutaneous emphysema developed following a hyperextension maneuver of the neck. Oxygen administration through the transtracheal oxygen catheter was suspended and replaced by oxygen through a nasal prong. After 48 h, the transtracheal catheter was taken into use again. Fifteen days later, subcutaneous emphysema developed once more. This time the position of the catheter tip was surgically explored. No abnormalities were seen and the catheter was left in situ.

Finally, one month after placing the transtracheal catheter, the patient's condition suddenly became very critical with rapidly progressive laryngeal stridor with severe dyspnea and profound cyanosis. Direct laryngoscopy revealed a mucous plug surrounding the tip of the transtracheal catheter that almost totally obstructed the tracheal lumen. Thereafter, a bronchoscopy was performed. It appeared impossible to remove the plug from the tip of the catheter and thus from the lumen of the trachea. During an emergency tracheostomy, the tip of the catheter was pulled out of the trachea. The sputum plug remained behind but could then easily be removed from the trachea with forceps (Fig 1). The tracheal mucosa appeared normal at inspection. Subsequently, a tracheal tube was left behind to maintain easy access to the airways.

DISCUSSION

The application of transtracheal oxygen catheters saves oxygen usage. Moreover, it enhances the patient's mobility and offers aesthetic advantages. Complications of these catheters are usually mild and only temporal. We described a patient who developed a life-threatening complication following the installation of a transtracheal catheter (ITO,C). To our knowledge, this is the first time a nearly fatal complication is reported from the use of this catheter. Our patient who was suffering from chronic bronchitis had recurrent bronchial infections with moderately large amounts of sputum during the time this transtracheal catheter had been installed. These infections may have been due to the natural course of his underlying disease, but it cannot be excluded that the foreign body formed by the transtracheal catheter contributed. Fletcher et al reported a case of an endotracheal mass adherent to a SCOOP catheter. The plug almost totally obstructed the trachea and proved nearly fatal to our patient. After removal of the plug with forceps during an emergency tracheostomy, it fell apart into two pieces, which are shown in this figure. Shown sizes represent centimeters.

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Figure 1. Two parts of a mucous plug that had been formed around the tip of a transtracheal oxygen catheter. The plug almost totally obstructed the trachea and proved nearly fatal to our patient. After removal of the plug with forceps during an emergency tracheostomy, it fell apart into two pieces, which are shown in this figure. Shown sizes represent centimeters.
transtracheal catheter in a patient with only scanty sputum production. This mass was apparently formed from inflammatory protein secretions and originated adjacent to an ulcerated area of the posterior tracheal mucosa. In our patient, no ulceration of the tracheal mucosa was encountered. It seems therefore plausible that the production of sputum and its increased viscosity due to infections caused the formation of this huge mucous plug in our patient. Adamo et al. reported on three patients with inspissated mucous plugs and one patient with a large inspissated tracheal cast after the use of transtracheal oxygen catheters other than the one we used (ITO,C). The latter one also resulted in upper-airway obstruction and acute respiratory failure. Emergency bedside bronchoscopy could remove the plug in this patient.7 Hoffman et al.3 report that mucous plugs are, in general, easy to remove. In our patient, it appeared impossible to remove the mucous plug by bronchoscopy. The formation of mucous plugs on transtracheal oxygen catheters has only been reported from the use of SCOOP or similar-type catheters. These catheters have a large area inserted in the trachea. The transtracheal oxygen catheter (ITO,C) we used has only a minimal part of the tip inserted and thus less area for the formation of mucous plugs. The latter catheters were therefore considered safe in this respect until now. After this experience, we decided to discontinue the use of transtracheal catheters in patients with excessive sputum production or recurrent bronchial infections.

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Behçet's Disease Presenting With a Pulmonary Mass Lesion

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We report a case of Behçet's disease with pulmonary and splenic involvement. The radiologic presentation was quite different from the modes defined in the literature. A large, anteriorly located, well circumscribed ovoid mass was the x-ray film image of a large area of infarction with hemorrhage. The involved pulmonary artery showed signs of vasculitis with thrombus formation. To our knowledge, this mode of presentation is different from the cases reported in the literature. (Chest 1993; 104:1635-36)

Behçet's disease has worldwide distribution, but Orientals and those from the Eastern Mediterranean countries have the highest incidence of the disease.1 Pulmonary manifestations of the disease are well described in several series.2 In this report, we describe a patient with a mass lesion in the right lung who concealed the diagnosis of Behçet's disease 2 years earlier, based on neurologic symptoms.

With this case in mind, we suggest a review of Behçet's disease in patients with a mass lesion of the lung, especially in the geographic areas mentioned previously.

CASE REPORT

A 41-year-old man was admitted to the pneumology clinic with recurrent episodes of hemoptysis, dyspnea, and chest pain. He gave a history of splenectomy done for splenic abscess 6 months ago. Physical examination was normal except for diminished breath sounds over the right chest wall. The erythrocyte sedimentation rate was 80 mm/h. A chest x-ray film revealed a large, well-circumscribed ovoid mass lesion of the right upper and middle lung fields. Results of sputum culture and cytology were negative for malignancy. The computed tomography scan of the chest revealed a 53 × 61 mm mass lesion in the right upper lobe. Nothing pathologic was observed during bronchoscopy except extrinsic compression of the intermediate carina.

Results of a biopsy specimen taken from this area and lavage fluid were inconclusive. Because the mass had a 166 HU density, transthoracic needle aspiration biopsy was performed with computed tomographic guidance. Biopsy material showed inflammatory cells. The patient was transferred to the department of thoracic and cardiovascular surgery for exploratory thoracotomy. The night before the operation, he experienced hemoptysis (1,000 ml) which ceased spontaneously.

The operation was carried on as scheduled on the following day. A well encapsulated, tense 10 × 10 cm mass was seen occupying the anterior segment of the right upper lobe. There was no pulsation. We decided to do an upper lobectomy and refrained from taking a sample for frozen section because the consistency of the mass gave us the impression that it could easily burst and contaminate the field. The capsule was torn during the dissection, liberating old and new thrombus with bleeding. An upper lobectomy was completed under normal conditions. His postoperative course was uneventful, and he was discharged on the 10th day.

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