Tzu Chi Medical Journal 2017; 29(1): 59-61

Case Report

Anesthesia for a patient with unexpected giant tracheobronchomegaly

Chien-Ching Lee[a,b], Bor-Shyh Lin[b], Jen-Yin Chen[a], Chia-Chun Chuang[a]*

[a]Department of Anesthesiology, Chi Mei Medical Center, Tainan, Taiwan, [b]Institute of Imaging and Biomedical Photonics, National Chiao Tung University, Tainan, Taiwan

Received : 08-11-2016
Revised : 18-11-2016
Accepted : 15-12-2016

Abstract

Tracheobronchomegaly (also called Mounier–Kuhn syndrome) is a rare disease characterized by flaccid and markedly dilated trachea and main bronchi on inspiration with narrowing or collapse on expiration or cough. It is associated with recurrent lower respiratory tract infection. A 75-year-old man with unexpected giant tracheomegaly had a significant peritubal air leak which impeded an operation. Lumbar epidural anesthesia was performed for a subsequent operation without any sequela. Careful evaluation with chest radiography is basic to exclude a large airway. Chest computed tomography and fiber-optic bronchoscopy provided the diagnosis of a large airway. If a large airway is suspected, these examinations help to evaluate and manage the airway.

Keywords: *Anesthesia, Mounier–Kuhn syndrome, Tracheobronchomegaly, Tracheomegaly*

Introduction

Tracheobronchomegaly (also called Mounier–Kuhn syndrome) is a rare syndrome consisting of marked dilatation of the trachea and major bronchi, usually due to a congenital defect of the elastic and muscle fibers [1]. The abnormally widened trachea and main stem bronchi are associated with recurrent lower respiratory tract infections and copious purulent sputum production, eventually leading to bronchiectasis and other respiratory complications [2].

Case report

Our case was a 75-year-old man who was a heavy smoker with a chronic cough associated with production of copious purulent sputum and chronic pulmonary parenchymal changes as evidenced by both auscultation and chest radiographs [Figure 1]. Pulmonary function tests had disclosed moderately obstructive ventilatory impairment 2 years previously. He was admitted for the surgery for a local flap and debridement in the prone position due to sacral pressure sores with tissue defects.

He had no previous documented surgeries or airway problems. This patient refused regional anesthesia for the first surgery, and general endotracheal anesthesia was induced with 0.01 mg/kg intravenous atropine, 1.5 mg/kg propofol, 2 μg/kg fentanyl, and 1.5 mg/kg succinylcholine. The patient was initially intubated with a 7.5 mm internal diameter (ID) oral endotracheal tube. Anesthesia was maintained with sevoflurane and cisatracurium. However, circle leakage was displayed on the anesthesia machine monitor with a tidal volume of only 100 mL (setting 550 mL). A significant peritubal air leak was identified, which was never eliminated completely despite reinflation of the endotracheal tube cuff with air. Larger endotracheal tubes of 8.0 mm ID and 8.5 mm ID were also tried but unsuccessfully. Flexible fiber-optic bronchoscopy [Figure 2] revealed tracheal dilatation, tracheomalacia with dynamic collapse, and profusely purulent secretions in the bilateral lower lobes. Hypoxia and hypercapnia were evident. Surgery was postponed because of the precarious airway. Chest computed tomography (CT) [Figures 3 and 4] displayed tracheobronchomalacia, tracheobronchomegaly, and bilateral atelectasis in the lower lobes. Lumbar epidural (L2–L3) anesthesia was recommended to the patient, and

*Address for correspondence:
Dr. Chia-Chun Chuang,
Department of Anesthesiology,
Chi Mei Medical Center, 901, Zhonghua Road,
Yongkang City, Tainan, Taiwan.
E-mail: otzison@hotmail.com

Access this article online

Quick Response Code:

Website: www.tcmjmed.com

DOI: 10.4103/tcmj.tcmj_1_17

How to cite this article: Lee CC, Lin BS, Chen JY, Chuang CC. Anesthesia for a patient with unexpected giant tracheobronchomegaly. Tzu Chi Med J 2017;29:59-61.

0.25% bupivacaine 15 mL was injected into the epidural space. This patient was satisfied with the regional anesthesia, and the surgery was completed without any sequela.

Discussion

Tracheobronchomegaly may be completely asymptomatic and is misdiagnosed frequently, especially in asymptomatic patients. The usual clinical features include a productive, chronic cough with copious, purulent sputum, low-grade fever, and symptoms consistent with chronic respiratory tract infection (dyspnea, hoarseness, and loud cough) [3]. It is characterized by flaccid and markedly dilated trachea and main bronchi on inspiration with narrowing or collapse on expiration or cough [4,5]. During respiration, the tracheobronchial wall can easily collapse resulting in partial or complete obstruction. One would expect extrathoracic tracheal collapse to occur during inspiration and intrathoracic collapse with expiration, and therefore, the nature of the symptoms and signs depends on the site of the abnormality [6]. The condition results from atrophy or the absence of elastic fibers and thinning of muscle. The grossly enlarged but weakened airway and inefficient cough mechanism block mucociliary clearance leading to mucous retention with resultant recurrent pneumonia, bronchiectasis, and fibrosis. Excessive sputum production with occasional hemoptysis occurs, and patients may develop dyspnea and respiratory failure as the lungs become progressively damaged. In addition, spontaneous pneumothorax, hemoptysis, pneumonia, and finger clubbing may develop [7].

Tracheobronchomegaly, also called Mounier–Kuhn syndrome, is diagnosed from chest radiographs when the transverse and sagittal diameters of the trachea exceed 21 mm and 23 mm, respectively, in women, and 25 mm and 27 mm, respectively, in men [8]. Eight cases of tracheobronchomegaly with its associated complications are reported. CT scan of the chest was used for the diagnosis of tracheobronchomegaly [2]. In another case report, an 84-year-old man admitted for transapical aortic valve implantation under general anesthesia had a peritubal air leak and three different endotracheal tubes were tried. There was no further air leak with a 9.0 mm endotracheal tube. Postoperative chest CT revealed the maximum outer diameter of the trachea was 34.1 mm [9]. In fiber-optic bronchoscopy, tracheobronchomegaly is characterized by dynamic collapse during coughing or forced expiration. CT and bronchoscopy are suggested to identify the pathology and etiology of a large airway. Commonly encountered diseases of the large airway include tracheobronchial amyloidosis, tracheobronchopathia osteochondroplastica,

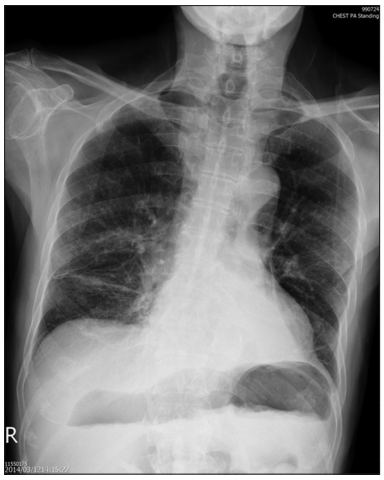

Figure 1: Fusiform dilatation of the trachea

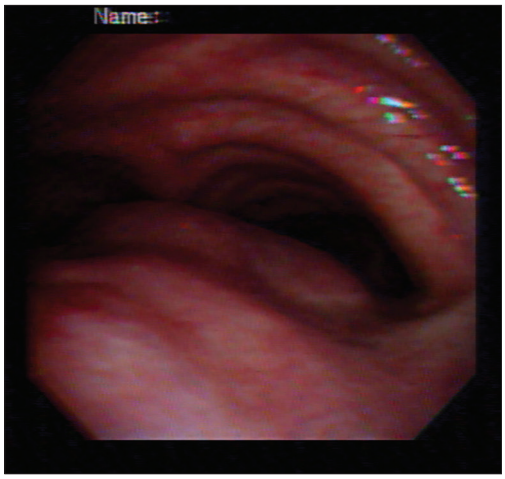

Figure 2: Tracheal dilatation and tracheomalacia with dynamic collapse during cough or forced expiration

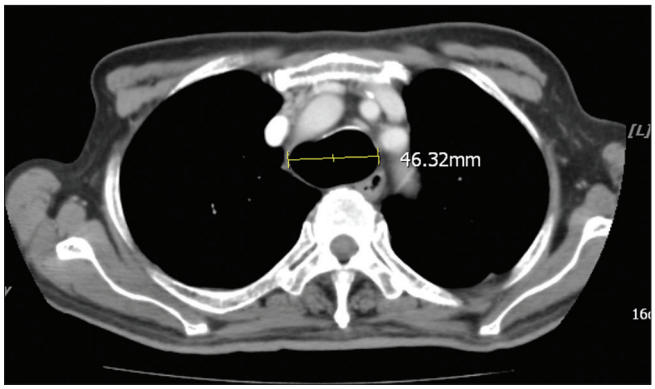

Figure 3: Tracheomegaly with an internal diameter of 46.32 mm

tracheobronchomegaly, laryngotracheobronchial papillomatosis, relapsing polychondritis, Wegener granulomatosis, sarcoidosis, and tracheal stenosis [10]. In our report, the maximum internal transverse diameter of the trachea was 46.32 mm and the outer diameter up

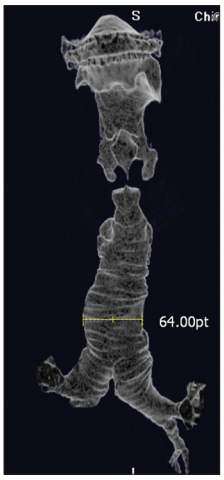

Figure 4: Tomographic image reconstruction showing a maximum outer diameter of up to 64 mm

to 64 mm on chest CT [Figures 3 and 4]. The trachea was fusiform on tomographic image reconstruction [Figure 4]. The trachea was too large for our available endotracheal tube (8.5 mm ID). Bronchoscopy was also used to diagnose this large airway.

Tracheobronchomegaly should be recognized before an operation when general anesthesia with endotracheal tube intubation is used. A significant peritubal leak may be problematic and insufficient ventilation may impede the surgery [11]. Thus, the anesthesiologist must consider respiratory tract problems, including tracheomegaly, in patients with these types of medical histories. Bourne *et al*. chose a larger diameter endotracheal tube with cuffs for general anesthesia combined with epidural anesthesia for one patient [12]. There is a danger of pulmonary aspiration due to severe air leakage around the cuff. In our case, there were too many shadows overlapping the superior mediastinum on the chest radiograph [Figure 1] including emphysematous lungs, the thymus, superior vena cava, aortic arch, trachea, esophagus, thoracic duct, and thyroid. We just focused on the shape of the lungs and heart but ignored the dilated trachea. A larger endotracheal tube did not solve the problem.

Financial support and sponsorship

Nil.

Conflicts of interest

There are no conflicts of interest.

Declaration of patient consent

The authors certify that the patient have obtained appropriate patient consent form. In the form the patient has given his consent for his images and other clinical information to be reported in the journal. The patient understands that his name and initial will not be published and due efforts will be made to conceal their identity, but anonymity cannot be guaranteed.

References

1. Schwartz M, Rossoff L. Tracheobronchomegaly. Chest 1994;106:1589-90.
2. Menon B, Aggarwal B, Iqbal A. Mounier-Kuhn syndrome: report of 8 cases of tracheobronchomegaly with associated complications. South Med J 2008;101:83-7.
3. Schmitt P, Dalar L, Jouneau S, Toublanc B, Camuset J, Chatte G, et al. Respiratory conditions associated with tracheobronchomegaly (Mounier-Kuhn syndrome): A study of seventeen cases. Respiration 2016;91:281-7.
4. Sundaram P, Joshi JM. Tracheobronchomegaly associated tracheomalacia: analysis by sleep study. Indian J Chest Dis Allied Sci 2004;46:47-9.
5. Jaiswal AK, Munjal S, Singla R, Jain V, Behera D. A 46-year-old man with tracheomegaly, tracheal diverticulosis, and bronchiectasis: Mounier-Kuhn syndrome. Lung India 2012;29:176-8.
6. Payandeh J, McGillivray B, McCauley G, Wilcox P, Swiston JR, Lehman A, et al. A Clinical classification scheme for tracheobronchomegaly (Mounier-Kuhn syndrome). Lung 2015;193:815-22.
7. Van Schoor J, Joos G, Pauwels R. Tracheobronchomegaly – The Mounier-Kuhn syndrome: report of two cases and review of the literature. Eur Respir J 1991;4:1303-6.
8. Woodring JH, Howard RS 2nd, Rehm SR. Congenital tracheobronchomegaly (Mounier-Kuhn syndrome): A report of 10 cases and review of the literature. J Thorac Imaging 1991;6:1-10.
9. Casso G, Schoettker P. Images in clinical medicine. Tracheobronchomegaly. N Engl J Med 2016;374:e14.
10. Obusez EC, Jamjoom L, Kirsch J, Gildea T, Mohammed TL. Computed tomography correlation of airway disease with bronchoscopy: part I – Nonneoplastic large airway diseases. Curr Probl Diagn Radiol 2014;43:268-77.
11. Parris WC, Johnson AC. Tracheomegaly. Anesthesiology 1982;56:141-3.
12. Bourne TM, Raphael JH, Tordoff SG. Anaesthesia for a patient with tracheobronchomegaly (Mounier-Kuhn syndrome). Anaesthesia 1995;50:545-6.