

CASE STUDY

Endobronchial tuberculosis with expectoration of tracheal cartilages

M.J. Park, I.S. Woo, J.W. Son, S.J. Lee, D.G. Kim, E.K. Mo, M.G. Lee, I.G. Hyun, K.S. Jung

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ABSTRACT: A case of endotracheal tuberculosis with expectorations of the lateral one-third of the multiple tracheal cartilages is reported. Fiberoptic bronchoscopy revealed caseous materials and loosening of the tracheal cartilages. The patient expectorated cartilaginous material several times before and after fiberoptic bronchoscopy. In spite of the loss of tracheal cartilages, tracheal lumen was maintained with a mild airflow limitation. The remaining two-thirds of the tracheal cartilage rings seemed to be strong enough to support the tracheal lumen opening during the respiratory cycle. Although rare, expectoration of bronchial cartilage can be one of the clinical features of endobronchial tuberculosis.

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Dept of Internal Medicine, Hallym University, Seoul, Korea.

Correspondence: M.J. Park, Dept of Internal Medicine, Hallym University, Kangnam Sacred Heart Hospital, 948-1 Daelim-dong, Yungdeungpo-ku, Seoul, Korea. 150-070. Fax: 82221815082

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Endobronchial tuberculosis is listed as one of the serious complications of pulmonary tuberculosis. Expectoration of bronchial cartilage is extremely rare in endobronchial tuberculosis. Only three previously reported cases have been found [1–3]. Coughing up tracheal cartilages has not been reported before. Such a case is reported in this study.

Case report

A 29 yr-old female, with a history of tuberculous lymphadenitis, presented with a severe barking cough and mild dyspnoea. She had noted cough, sputum and mild dyspnoea 2 months prior to visiting our hospital. She had taken some medications without improvement. She noted increasing dyspnoea in the supine position. On questioning, one day before the visit, she had expectorated three or four hard objects during coughing. On physical examination, her vital signs were stable. There was no wheezing or crackling sound during auscultation. Laboratory findings were within normal range. The sputum smear for acid-fast bacilli was positive. The chest radiograph showed faint fibro-streaky densities involving the left upper lobe. The forced vital capacity (FVC) was 2.32 L (63% of predicted), forced expiratory volume at 1 second (FEV₁) 2.09 L (61% pred), peak inspiratory flow (PIF) 2 L·min⁻¹. On the flow volume curves, the inspiratory limb had a very flat appearance, which suggests the presence of upper airway obstructive lesions (fig. 1).

Bronchoscopy revealed deep ulcers and two projections of cartilage on the left side of the distal trachea (fig. 2). Multiple, yellowish mucosal elevations were also noted in the distal trachea. The orifice of the left main bronchus was narrowed with caseous material. After the bronchoscopy, the patient expectorated two tracheal cartilages, which were the lateral one-third part of the tracheal

cartilage (fig. 3). After two weeks of treatment with antituberculosis drugs, the second bronchoscopy showed one small remaining tracheal cartilage with caseous material between the distal trachea and the orifice of the left main bronchus. The remaining small tracheal cartilage was removed by biopsy forceps. After treatment with antituberculosis drugs for 6 months and with corticosteroid for 1 month, the third bronchoscopy was performed. The last bronchoscopy was performed 2 yrs after the initial diagnosis. There were no significant differences between the two periods. The mucosal lesions of tuberculosis were completely healed. There was no progressive tracheal stricture. Four or five tracheal rings discontinued abruptly on the left side. On expiration the appearance of trachea was like a sabre sheath (fig. 4a). The orifice of the left main bronchus showed fibrostenotic narrowing (fig. 4b). There was no evidence of the recurrence of endotracheal tuberculosis on the last bronchoscopic examination.

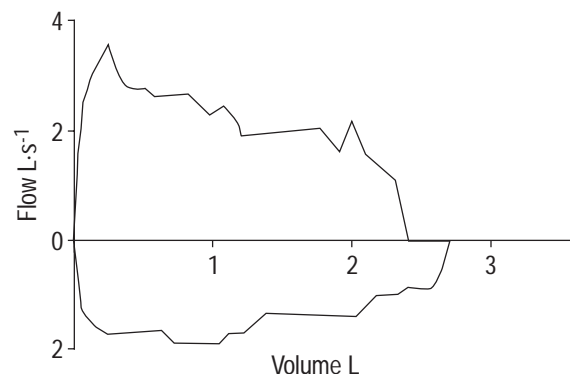


Fig. 1. – The shape of the initial flow volume loops.

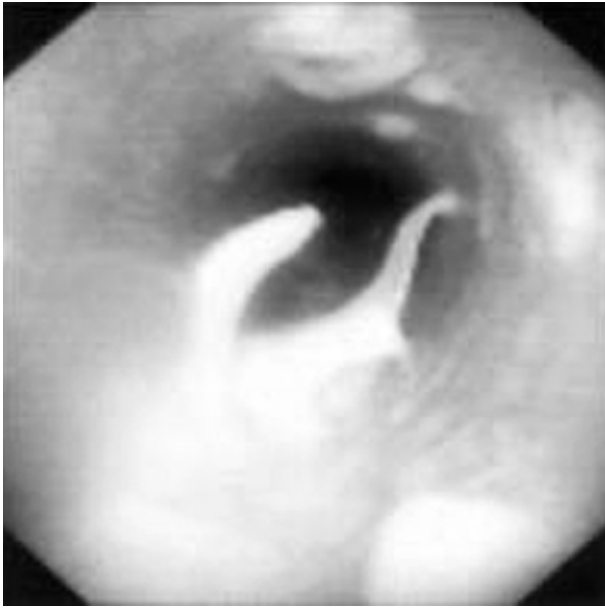


Fig. 2. – Initial bronchoscopy shows two cartilaginous projections with caseous material on the left side of the distal trachea. Multiple yellowish mucosal elevations were noted.

After one year, airflow limitation was improved: FVC 3.12 L (85% pred), FEV₁ 2.53 L (87% pred), PIF 2.8 L·min⁻¹. The inspiratory limb of the flow volume curves now showed a near normal rounded pattern.

Discussion

Only three reports of protrusions and expectorations of cartilages in endobronchial tuberculosis were found [1–3]. The first patient was an autopsy case. Ten years after treatment for pulmonary tuberculosis, this patient was admitted due to fever and cough with weight loss for 5 months. There was no bacteriological evidence of recurrence of tuberculosis. Bronchoscopy revealed a slit-like narrowing with normal mucosal surface in the lower third of the trachea. Cardiac arrest occurred during the procedure of the electrode section of the tracheal stenosis. At autopsy, the fourth cartilaginous ring above the bifurcation, was luxated inwardly, producing a severe sten-



Fig. 3. – The two tracheal cartilages are expectorated 6–7 h after the initial bronchoscopy. Scale bar=1 cm.



Fig. 4. – Bronchoscopic findings after 2 yrs. a) The appearance of the trachea is like a saber sheath on expiration. The lateral third of the tracheal rings disappear abruptly on the left side (arrows). b) The orifice of the left main bronchus shows narrowing and the sudden disappearance of the tracheal rings should be noted (arrows).

osis of tracheal lumen [1]. The second case was treated for pulmonary tuberculosis 25 yrs earlier. She expectorated a horseshoe shaped bronchial cartilage and her sputum smear for mycobacterium tuberculosis was positive. Bronchoscopy showed small, white, protrusions from the distal tracheal membrane, near the orifice of the left main bronchus. After the treatment, the left main bronchus showed a narrowing but it was corrected by a bronchoplasty [2]. The third patient coughed up a bronchial cartilage due to endobronchial tuberculosis, but the precise clinical course of this patient was not available [3].

Clinical manifestations of endobronchial tuberculosis vary and include chronic productive cough, barking cough, chest pain, haemoptysis, generalized weakness, dyspnoea and fever. Endobronchial tuberculosis can simulate bronchogenic carcinoma, polypoid mass, asthma, foreign body aspiration or pneumonia, and atelectasis [4–7]. It is not easy to diagnose endobronchial tuberculosis without a high index of a physician's suspicion. Expectoration of cartilage, as in the four cases listed here, is very rare as a presenting symptom.

During the initial bronchoscopy, it was difficult to decide whether to remove the protruding cartilage or not. It might have caused further damage, like tracheal rupture. On questioning, the patient had previously described the expectoration of three or four hard materials. It was decided not to remove the protruding cartilages in the hopes of observing spontaneous expectorations. Indeed, she did expectorate two cartilages 6–7 hrs after the bronchoscopy.

Bronchial stricture could develop despite effective treatment of endobronchial tuberculosis. This complication develops in 60–95% of cases [4, 5, 8]. In contrast to the autopsy case [1] and the Japanese case [2], our patient did not show severe stricture after the treatment. There was much improvement in the airflow limitation after 6 months of treatment with antituberculosis drugs and corticosteroids. Even though our patient lost five or six partial segments of the tracheal cartilage, she did not show severe airflow limitation. There was no progressive tracheal stricture during the treatment, because the remaining two-thirds of the tracheal cartilage prevented the airway from collapsing during the respiratory cycle.

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