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Systemic glucocorticoid and anti-tuberculosis therapy in a patient with coexisting tuberculosis and anthracosis

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Abstract. *Background:* Tuberculous lymphadenitis is a common condition in underdeveloped and developing countries. Anthracosis is the black pigmentation of bronchi caused by the deposition of carbon, silica and quartz particles in the macrophages of the bronchial mucosa and submucosa. There is a potential relationship between bronchial anthracofibrosis and tuberculosis (TB). *Objectives:* A 66 year old woman was referred to a chest diseases clinic when non-productive cough was noticed during a preoperative examination. Computerized tomography (CT) of thorax showed an infiltration in the right upper lobe and a lesion in the right apical lobe adjacent to the trachea. Extensive diagnostic tests including mediastinoscopic lymph node excision were performed. Anthracosis and coexisting tuberculosis were diagnosed. *Results:* Directly observed anti-TB therapy was immediately initiated. Systemic prednisolone was initiated at a dose of 30 mg/day and tapered slowly to the maintenance dose. Control thorax CT taken two months after the initiation of therapy revealed that the right upper lobe bronchus was open and atelectasis of the right upper lobe was resolved. Mediastinal calcified lymph nodes and fibrotic changes of both apical regions were observed. Being in the 10th month of the therapy, the patient is still totally asymptomatic in follow-ups. *Conclusions:* Glucocorticoid therapy may raise some concerns in patients with TB. Here, we present a case with anthracosis and coexistent TB, who responded very well to simultaneous anti-TB and glucocorticoid therapy. *(Sarcoidosis Vasc Diffuse Lung Dis 2013; 30: 308-311)*

Key words: anthracosis, tuberculosis, biomass, glucocorticoid, stenosis

Introduction

Anthracosis is the black pigmentation of bronchi caused by the deposition of carbon, silica and quartz particles in the macrophages of the bronchial mucosa and submucosa (1-3). It can lead to bronchial narrowing, obliteration, destruction and deformity, which is called anthracofibrosis. Tuberculous lymphadenitis is a common condition in underdeveloped and developing countries. There is a potential relationship between bronchial anthracofibrosis and tuberculosis (TB) (4). An association of anthracotic pigment with TB has been suggested: Airway pigmentation may be the result of TB, or it may be the result of smoke exposure that predisposes patients to TB through altered macrophage function (3). The possibility of active TB should always be considered in a patient with bronchial stenosis due to anthracofibrosis. The radiologic and bronchoscopic response of tuberculous lesions to treatment is important in excluding coexistent malignancy (3).

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There is no known treatment for anthracofibrosis but empirical antibiotic therapy for TB may be reasonable in patients with anthracofibrosis who live in areas where TB is endemic (5).

Here, we present a case with anthracosis and coexistent TB, who responded very well to simultaneous anti-TB and glucocorticoid therapy.

Case report

A 66 year old woman was referred to a pulmonary diseases clinic when non-productive cough was noticed during a preoperative examination for lumbar disc hernia. She complained of dyspnea and wheezing. She was a housewife who had no significant medical history. She has been on anti-epileptics since an in-vehicle traffic accident. She was a non-smoker, but has been using biomass, mostly as coal for indoor heating for more than ten years. Wheezing and rhonchi were heard on physical examination. Computerized tomography (CT) of thorax showed an infiltration in the right upper lobe and a lesion in the right apical lobe adjacent to the trachea. With a preliminary diagnosis of malignancy, positron emission tomography (PET) – CT scanning was performed which showed increased activity of a lesion 23 x 9 mm in size at the paramediastinal area of the right upper lobe and focally increased activities of multiple lymph nodes in the thorax and neck. These were interpreted as metastatic lymph nodes, so bronchoscopy was performed which revealed a discolored mucosal irregularity slightly raised from the surface of the anterolateral tracheal wall and a narrowed right middle lobe entrance, and anthracosis. Right upper lobe could not be evaluated. Histopathological examination of the bronchoalveolar lavage and the transbronchial needle aspiration biopsy did not give any clue for malignancy or acid-fast bacilli (AFB). Cultures for *Mycobacterium tuberculosis* were negative. Mediastinoscopic lymph node excision was performed and histopathological examination revealed anthracosis and reactive lymph nodes.

Six months later, the patient was evaluated again for increasing dyspnea, productive cough, noisy breathing and non-cardiac chest pain. She reported weight loss. On physical examination stridor, significant rhonchi on the right lung during both inspiration and expiration were heard. Sputum microscopy showed plenty of polymorphonuclear leucocytes, alveolar macrophages, coco-bacilli, and some atypical epithelial cells with hyperchromatic nuclei and narrow cytoplasm. With a presumptive diagnosis of small cell lung cancer leading to tracheal stenosis, fiberoptic bronchoscopy was performed once more. Carina was blunted and the left bronchial system was hyperreactive. Right main bronchus was concentrically narrowed by 90%. Pathologic evaluation of the biopsy specimen from the narrowed bronchus showed a small area of metaplasia and mild dysplasia. In follow-up of these confusing findings, PET/CT scan was repeated. It demonstrated a 10x11 mm calcified lesion with intense activity localized at the right lower paratracheal region adjacent to upper lobe bronchus opening which caused total atelectasis of upper lobe by compressing the bronchus of upper lobe. Additional hypermetabolic lymphadenopathies suspicious of malignancy localized bilaterally in mediastinum, cervical and upper abdominal areas were visualized.

As re-biopsy was recommended, the patient was admitted to our University Hospital. Re-evaluation of the clinical findings directed the pulmonologist to consider TB or sarcoidosis as the most likely diagnoses. A tuberculin skin test was done and revealed an induration of 21 mm (she was not vaccinated against TB). Serum angiotensin converting enzyme level was normal. Quantiferon test was positive. The previous mediastinal lymph node biopsy material was re-examined and was reported to demonstrate anthracosis and conglomerated granuloma consisting of epitheloid histiocytes and Langhans-type giant cells consistent with granulomatous lymphadenitis.

The patient was diagnosed to have TB coinciding with anthracosis and directly observed anti-TB therapy was immediately initiated. Systemic prednisolone was initiated at a dose of 30 mg/day and tapered slowly to the maintenance dose. Control thorax CT taken two months after the initiation of therapy was remarkable (Fig. 1a-b and Fig. 2). It revealed that the right upper lobe bronchus was open and atelectasis of the right upper lobe was resolved. Mediastinal calcified lymph nodes and fibrotic changes of both apical regions were observed. Being in the 10th month of the therapy, she is still totally asymptomatic in follow-ups.

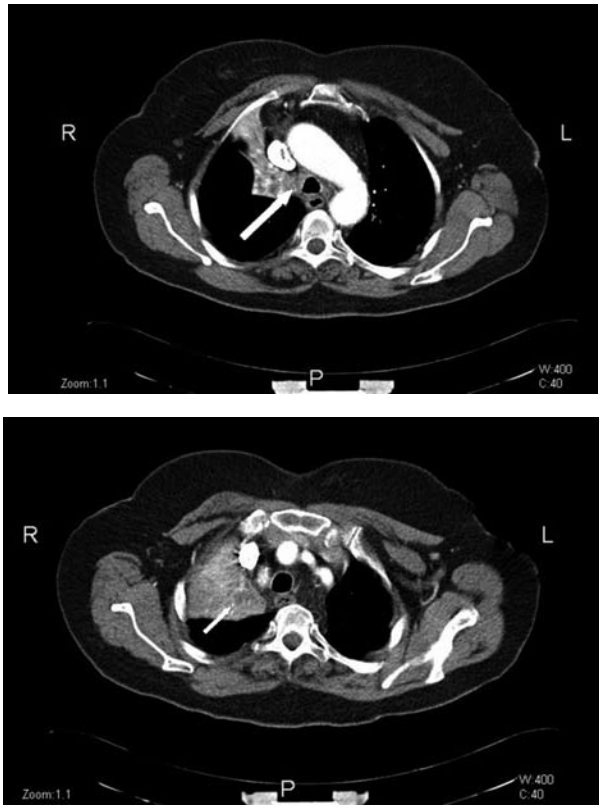

Fig. 1. a) and b) Computed tomography scans at the initiation of therapy that demonstrated severe thickening of the wall of the right upper lobe bronchus, total occlusion (big arrow) and associated atelectasis (small arrow)

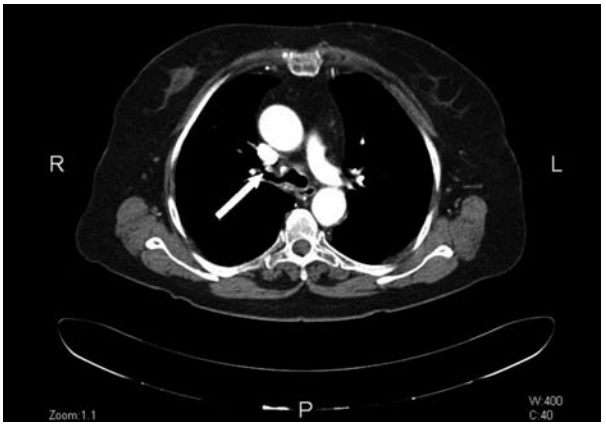

Fig. 2. Computed tomography scans after 2 months of therapy that demonstrated the opening of the right upper lobe bronchus (arrow) and the regression of atelectasis. The wall of the right upper lobe bronchus is minimally thickened. Partial volume loss is evident in the right upper lobe

Discussion

The patient presented here, is a demonstrative case to discuss the coincidence of TB and anthracosis. She was evaluated because of non-productive cough and noisy breathing and underwent several interventions to exclude a malignancy. However, diagnostic procedures involving mediastinoscopic lymph node excision, gave nothing but anthracosis and reactive lymph nodes. When the patient was readmitted six months later, repeat evaluation of the biopsy material by a more qualified pathologist confirmed the diagnosis. This underlines the importance of an experienced eye and clinical information in diagnosing TB, especially when coincident with other conditions.

Anthrocosis can develop due to various exposures to particles in the coal-mines and in any environment where there is smoke (7). Anthracosis is a rare condition in developed countries, but rather common in developing and underdeveloped countries where indoor air pollution resulting from the burning of biomass or wood smoke during cooking and baking has also been proposed as a possible cause. In one study, 81% of anthracofibrotic patients were non-smokers, the disease was more common in elderly females whom 91% were housewives (2,6). This disease is a major cause of obstruction in large bronchi causing respiratory symptoms such as cough, dyspnea and tendency for infections just like our patient (2). Chung et al. reported that the right middle lobe bronchus was most frequently involved and >60% of the patients had active TB infection. However, it was not easy to diagnose TB during the first examination because typical findings of active TB and constitutional symptoms were infrequent (6).

Anthracosis often causes intrapulmonary lymphadenopathy but rarely mediastinal mass or lymphadenopathy (8). The presence of bronchial stenosis, especially in conjunction with hilar and/or mediastinal lymphadenopathies, always raises the suspicion of malignancy. However, more than one stenotic bronchus, calcified lymph nodes and associated airway hyperpigmentation can lead the physician to a diagnosis of TB rather than malignancy. Tuberculous lymphadenitis is common in women and fibrotic response is more prevalent in older patients (6). The possibility of active TB should always be con-

sidered in a patient with bronchial stenosis due to anthracofibrosis in order to avoid unnecessary thoracotomy and appropriate anti-TB treatment should be started promptly

There is no known treatment for anthracofibrosis but empirical anti-TB treatment may be reasonable in patients with anthracofibrosis who live in areas where TB is endemic and can lead to definite improvement of chest radiographic findings (5, 6). It should be kept in mind that, even in developed countries immigrants may be presenting with anthracosis and/or tuberculosis.

Systemic glucocorticoid therapy has been hopefully used in patients with anthracosis, however no clear benefit could be demonstrated (9). Moreover steroid therapy may lead the doctor to anxiety when treating a patient with TB. We could not find any report with systemic glucocorticoid therapy for coincident anthracosis and TB, except for a Turkish patient who was treated with antituberculous treatment along with corticosteroid therapy in tapering doses (4). However, this patient died during follow-up due to stomach cancer, so long term prognosis was undetermined.

In conclusion, our patient is worth reporting to demonstrate that patients with co-existing anthracosis and TB can benefit much from systemic glucocorticoid therapy together with anti-TB therapy without exacerbating TB.

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References

1. Ghanei M, Aslani J, Peyman M, Asl MA, Pirnazar O. Bronchial anthracosis: A potent clue for diagnosis of pulmonary tuberculosis. Oman Med J 2011; 26: 19-22.
2. Mirsadraee M, Saeedi P. Anthracosis of the lung: evaluation of potential causes: Iran J Med Sci 2005; 30: 190-3.
3. Long R, Wong E, Barrie J. Bronchial anthracofibrosis and tuberculosis: CT features before and after treatment. Am J Roentgenol 2005; 184: S33-6.
4. Bircan HA, Bircan S, Ozturk O, Ozyurt S, Sahin U, Akkaya A. Mediastinal tuberculous lymphadenitis with anthracosis as a cause of vocal cord paralysis. Tüberk Toraks 2007; 55: 409-13.
5. Wynn GJ, Turkington PM, O'Driscoll BR. Anthracofibrosis, bronchial stenosis with overlying anthracotic mucosa: possibly a new occupational lung disorder: a series of seven cases from one UK hospital. Chest 2008; 134: 1069-73.
6. Chung MP, Kim H, Rhee CH, et al. Bronchial stenosis due to anthracofibrosis. Chest 1998; 113; 344-50.
7. Amoli K. Bronchopulmonary disease in Iranian housewives chronically exposed to indoor smoke. Eur Respir J 1998; 11: 659-63.
8. Argani P, Ghossein R, Rossai J. Anthracotic and anthracosilicotic spindle cell pseudotumors of mediastinal lymph nodes: Report of five cases of a reactive lesion that simulates malignancy. Human Pathol 1998; 29: 851-5.
9. Thrumurthy SG, Kearney S, Missons M, Haider Y. Diffuse interlobular septal thickening in a coal miner. Thorax 2010; 65: 82–84.