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CASE REPORT

Takayasu disease with prominent pulmonary artery involvement: confusion with pulmonary disease leading to delayed diagnosis

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Abstract Pulmonary artery involvement as the initial predominant clinical manifestation in Takayasu arteritis (TA) is rare. We describe a young adult female who presented with life-threatening complications of proximal pulmonary arterial involvement of Takayasu arteritis. In our case, atypical presentation of TA with pulmonary symptoms due to pulmonary artery involvement resulted in an erroneous initial diagnosis of sarcoidosis and then tuberculosis. The frequency of such a clinical form could be underestimated given the difficulties involved in its diagnosis and because its features are similar to those of pulmonary disease.

Keywords Takayasu arteritis · Pulmonary artery involvement

Introduction

Takayasu disease is an idiopathic arteritis which mainly affects the aorta and its major branches; less commonly it may affect the pulmonary arteries [1]. However, pulmonary artery involvement as the initial predominant clinical manifestation is rare. The pulmonary manifestations of Takayasu arteritis (TA) are frequently overshadowed by the involvement of systemic large arteries. We describe a young adult female who presented with life-threatening complications of proximal pulmonary arterial involvement of Takayasu arteritis. This atypical presentation of TA with pulmonary symptoms due to pulmonary artery involvement resulted in an erroneous initial diagnosis of sarcoidosis and then tuberculosis. Clinical manifestations of systemic artery involvement appeared several years after the manifestations of pulmonary artery involvement. In the present report we would like to emphasize two unusual features of TA: pulmonary artery involvement may be the first and most prominent manifestation of disease, and pulmonary artery involvement can clinically mimic primary pulmonary disease which may lead to misdiagnosis with dramatic consequences.

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Case report

A 34-year-old women was referred to our hospital because of progressive exertional dyspnea and hemoptysis. Her past medical history revealed that she had received a diagnosis of sarcoidosis six years previously. Two years earlier, she had again been admitted with symptoms of cough, hemoptysis and dyspnea, resembling those of the present admission, and had been diagnosed with tuberculosis in addition to sarcoidosis. She had no history of peripheral venous thromboses or episodes of acute pulmonary thromboembolism.

On physical examination she was in respiratory distress. Her right brachial and radial pulses were absent and her blood pressure was 125/80 mmHg as measured from the left arm. Bruits were audible over the course of the right carotid artery and the right subclavian artery. Her breath sounds were slightly wheezy and there were crackles in the right lung field. Her laboratory analysis showed: white blood cell

count: 12,700/mm^3, C-reactive protein: 23.2 mg/dl, erythrocyte sedimentation rate: 13 mm/h, antinuclear antibody (ANA): (−), rheumatoid factor: (−), calcium: 8.9 mg/dl, C-ANCA: (−), P-ANCA: (−), C3: 1.1 g/l, C4: 0.18 g/l, normal protein C, protein S and antithrombin values. Antiphospholipid antibodies were negative.

A ventilation–perfusion scan revealed normal ventilation in both lungs but a near-total perfusion defect in the right lung. Low extremity vascular evaluation by Doppler ultrasonography demonstrated no abnormality. Consequently a spiral computed tomography was performed showing total occlusion of the right pulmonary artery and no evidence of pulmonary embolism (Fig. 1). The right intercostal and bronchial arteries were prominent secondary to pulmonary artery occlusion. The proximal part of the pulmonary artery was dilated. Pathological changes in the right lung consistent with chronic bronchitis were also noted. Echocardiography documented right atrial and right ventricular enlargement and significant tricuspid regurgitation with an estimated peak systolic pulmonary artery pressure of 75 mmHg. Angiography of the aorta documented stenosed right common carotid artery and right subclavian artery and total occlusion of right vertebral artery (Fig. 2). Aortograms did not demonstrate any involvement of the thoracic and abdominal aorta, but enlarged right bronchial arteries supplying the hypoperfused right lung were noted. The ECG of the patient revealed widespread ST segment depressions and T wave inversions in anterior derivations. Consequently, a coronary angiogram was performed, which showed normal coronary arteries and perfusion of right lung via a shunt of collateral vessels from right and circumflex coronary arteries (Fig. 3). A concomitant hemodynamic study revealed a pulmonary artery pressure of 76/15 (mean 39 mmHg).

We diagnosed the patient as having Takayasu arteritis based on the following findings fulfilling the American College of Rheumatology 1990 criteria [2]: age at disease onset <40 years, presence of claudication of upper right extremity and bruit over subclavian artery, absence of brachial arterial pulse, and finally arteriographic narrowing of the large arteries in the proximal upper extremities and occlusion of the pulmonary artery.

Her symptoms got significantly better during hospitalization and the patient was discharged with medication of prednisolone 60 mg/day, methotrexate 20 mg/week, bosentan 125 mg day, sildenafil 100 mg/day and oral anticoagulation with warfarin. As a response to treatment, an echocardiography examination revealed a decrease in the peak systolic pulmonary artery pressure to 57 mmHg. Although she seemed to be responsive to medical treatment with a modest decrease in pulmonary artery pressure, the patient died suddenly two months after hospital discharge.

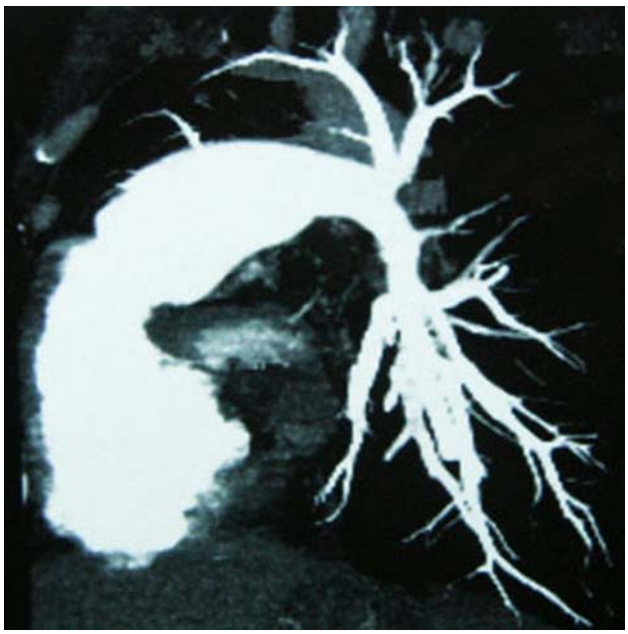

Fig. 1 Computed tomography, showing total occlusion of the right pulmonary artery

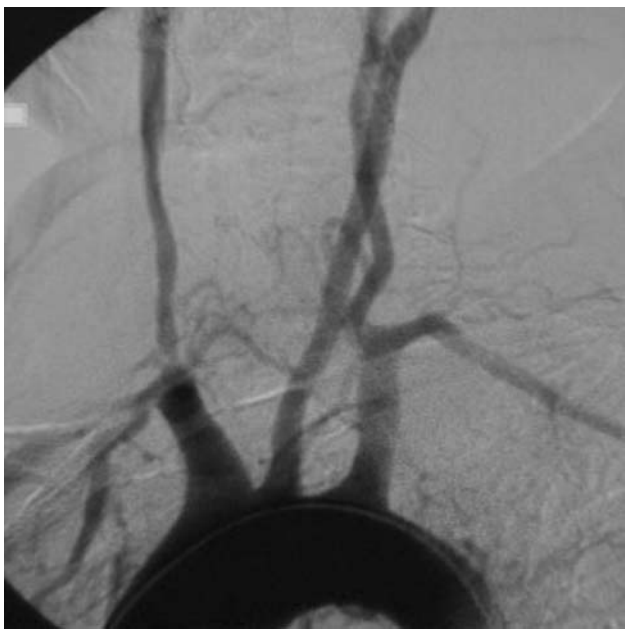

Fig. 2 Angiography of the aorta, revealing stenosed right common carotid artery and right subclavian artery and total occlusion of right vertebral artery

Discussion

Takayasu arteritis is a chronic inflammatory disease of large vessels, predominantly of the aorta and its main branches, and it occurs with a predilection for young adult females. Pulmonary arteries are also known to be involved in 50–80% of patients [3, 4]. TA cases with isolated

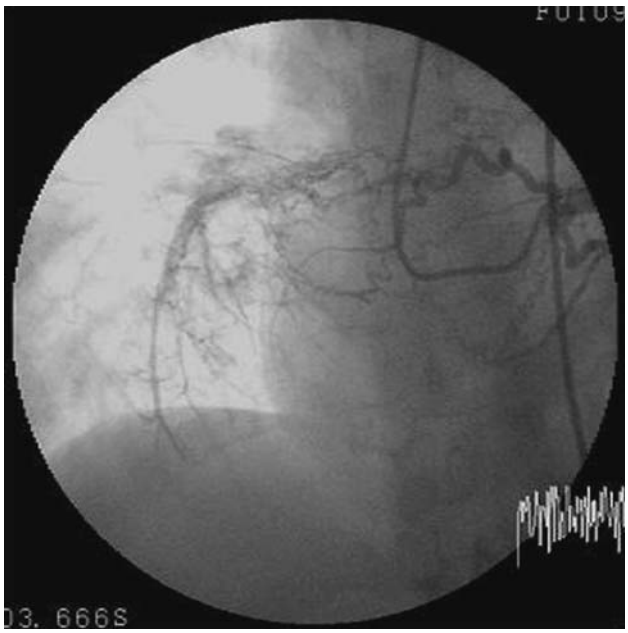

Fig. 3 Coronary angiography, revealing the presence of a shunt of collateral vessels from the left coronary branch to the peripheral segment of the right pulmonary artery

pulmonary involvement have also been reported [5]. Clinical manifestations of TA vary widely, depending on the site and degree of arterial lesions. In addition to the general symptoms of asthenia, weight loss and fever, predominant clinical features are reduced peripheral arterial pulse amplitude, vascular bruit, elevated blood pressure and dyspnea on exertion [3–7]. These findings are typically due to the involvement of the aorta and its main branches. Although subclinical involvement of pulmonary arteries in TA is common, symptoms caused by pulmonary artery lesions are rare. These rare pulmonary symptoms also typically occur as late manifestations [5–9]. Our patient demonstrates a much more exceptional feature of TA: symptoms associated with pulmonary artery involvement as the initial and predominant manifestation of TA. Symptoms and signs encountered in TA patients with initial and severe PA involvement are mainly respiratory, including chest pain, pleural effusion and hemptysis [4, 5, 7, 10]. These unusual cases are often difficult to distinguish from primary lung disease. There are also reported cases of TA in which the symptoms and signs of pulmonary arterial involvement were early dominant features and in whom signs and symptoms of systemic arterial involvement appeared years later [9, 11]. The interval between the onset of symptoms and the diagnosis of TA in these cases ranged from 1 to 16 years. The initial diagnosis in these cases included primary pulmonary hypertension, chronic pulmonary embolism and tuberculosis [5, 7]. Significant stenosis of brachiocephalic trunk and symptoms and signs related to this involvement were a very late manifestation in the present case. There are no previous medical records documenting a blood pressure difference between the right and left arms. A slight decrease in the blood pressure of the right arm is easily missed if the measurement is not performed from the contralateral arm. Therefore, a complete physical examination, including blood pressure measurements from both arms and careful examination of peripheral pulses is of paramount importance for diagnosis.

The most characteristic findings of pulmonary artery involvement in TA are stenosis or occlusion, mainly of the segmental and subsegmental arteries and less commonly of the lobar or main pulmonary arteries [1]. Unilateral total occlusion of right or left pulmonary artery is very rare and can occur in advanced and late-phase disease.

Progressive narrowing of pulmonary arteries is also seen in bronchial carcinoma and mediastinal fibrosis in addition to TA. Total occlusion of pulmonary arteries can be congenital or acquired in origin. The most common acquired causes of total pulmonary artery occlusion include pulmonary embolism and pulmonary artery sarcoma. TA patients with predominant pulmonary artery manifestations may be difficult to distinguish from chronic pulmonary embolism since the clinical presentation and angiogram pattern can be quite similar in both diseases. The development of a shunt formation or communication between the bronchial and coronary arteries to the peripheral portion of the pulmonary arterial tree is a characteristic finding associated with the significant reduction of pulmonary blood flow, and it is considered a compensatory mechanism which supplies the lung [1, 7, 12]. Due to the gradual pulmonary artery obstruction accompanied by a collateral blood supply, symptoms associated with pulmonary infarction are rare in patients with pulmonary involvement [3]. The presence of a well-developed collateral circulation and elevated pulmonary artery pressure also indicated chronic pulmonary artery involvement rather than an acute occlusion.

In our case, atypical presentation of TA with pulmonary symptoms due to pulmonary artery involvement resulted in an erroneous initial diagnosis of sarcoidosis and then tuberculosis. This delay in diagnosis presumably led to progression of the disease, complete occlusion of the right pulmonary artery and development of severe pulmonary hypertension, which could have been prevented by applying the appropriate treatment several years ago. The frequency of such a clinical form could be underestimated given the difficulties involved in its diagnosis and because its features are similar to those of pulmonary disease. It is important to consider TA as an underlying disease in young adult females with unexplained respiratory symptoms and pulmonary artery obstruction of unknown origin, where early treatment can lead to a favorable clinical course.

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