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Case Report

Takayasu Arteritis Associated with Nonspecific Interstitial Pneumonia and Ulcerative Colitis

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ABSTRACT

Takayasu arteritis was diagnosed in a 36-year-old woman on the basis of an aortic biopsy obtained at aortic value replacement. At age 45 years, she received a diagnosis of ulcerative colitis and had since been treated with medications. At age 49 years, she was admitted for reoperation to repair leaks at the suture ring of the prosthetic valve. However, she died of progressive respiratory failure. Autopsy revealed nonspecific interstitial pneumonia, old Takayasu arteritis, severe left ventricular dilatation, and partial dislocation of the prosthetic value. Inflammatory activity of ulcerative colitis had almost completely subsided. The association of Takayasu arteritis with ulcerative colitis and nonspecific interstitial pneumonia reported here is rare. This case strongly suggests that these diseases have common immunologic factors in pathogenesis and pathophysiology. (Jikeikai Med J 2010 ; 57 : 33-8)

Key words : Takayasu arteritis, interstitial lung diseases, ulcerative colitis, immunologic factors, autopsy

INTRODUCTION

Takayasu arteritis is defined as a granulomatous vasculitis involving the aorta and its major branches with inflammatory destruction of the media[1,2]. It is also called "pulseless disease" because of the weak or absent pulses in the upper extremities due to severe luminal narrowing of the diseased arteries. The disease occurs predominantly in young, female Asians. According to a report by the Ministry of Health, Labour and Welfare of Japan, approximately 5,000 patients with Takayasu arteritis were treated in a recent year, and 100 to 200 new patients are identified every year.

The cause and pathogenesis of Takayasu arteritis are unknown. The disease has been hypothetically linked to infectious diseases, such as tuberculosis and streptococcosis, collagen vascular disease, genetic factors, and autoimmunity. Recently, much attention has been focused on autoimmune mechanisms as a possible cause of the disease. We report a rare autopsy case of Takayasu arteritis associated with interstitial pneumonia and ulcerative colitis. The cause and pathogenesis of all 3 diseases are unknown.

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REPORT OF A CASE

A 49-year-old woman was admitted to our hospital for reoperation to repair a leaking prosthetic aortic valve and died of respiratory failure 14 days after admission. The patient had undergone aortic-valve replacement for aortic regurgitation at 38 years of age. A biopsy of the aorta showed severe destruction of the aortic media and elastic fiber clumping, leading to a diagnosis of Takayasu arteritis. At the age of 45 years, she had bloody stool, and endoscopic examination and rectal biopsy indicated ulcerative colitis, which was then treated with salazosulfapyridine. The final endoscopic examination at age 49 years showed only mild mucosal changes of the sigmoid colon which indicated the resolving stage of the disease. At age 48 years, cardiac ultrasonography revealed paravalvular leaks due to prosthetic valve dehiscence. At age 49 years, she was admitted for repeat aortic valve replacement. After admission, respiratory distress with a fever developed owing to pulmonary congestion caused by cardiac failure. Despite treatment with antibiotics and cardiac diuretics, she died of progressive cardiopulmonary failure 14 days after admission.

AUTOPSY FINDINGS

Autopsy was performed 75 minutes after death. Table 1 shows the main autopsy findings. Findings of the main organs are as follows.

The aorta and its major branches: Macroscopic examination revealed conspicuous dilatation of the aorta from the origin of the ascending aorta to the origins of the renal arteries from the abdominal aorta (Fig. 1A, B, C). The aorta showed moderate wall thickening and marked atherosclerosis of the inner surface. Although the orifices of the brachiocephalic and the common carotid arteries were moderately narrowed, severe luminal narrowing of the major branches was not seen. Histologic examination of the thoracic aorta showed disintegration of the media with elastic fiber clumping, markedly thickened intima with atherosclerosis, and adventitial fibrosis (Fig. 2). Similar lesions were observed in the bilateral carotid arteries. These findings were considered to be compatible with pathologic changes due to Takayasu arteritis.

Table 1. Main autopsy findings

1	Takayasu arteritis-associated aortic valve insufficiency
2	Signs of chronic cardiac failure
3	Interstitial pneumonia
4	Signs of acute circulatory insufficiency
5	Bilateral kidneys (right 99 g, left 145 g) show signs of terminal phase circulatory disturbance; atrophic right kidney
6	Proctocolitis: Ulcerative colitis, inactive
7	Bone marrow dominated by mature granular leukocytes
8	Intact bilateral adrenal glands (right 5 g, left 10 g)
9	Intact thyroid gland (16 g)
10	Pancreas with intact external and endocrine secretion, mild fatty change
11	Atrophic uterus and ovaries
12	Accessory spleen
13	Cadaver of a middle-aged woman with normal nutritional state (height 150 cm, weight 48 kg)

Heart: The heart with pericarditis was hypertrophied and weighed 704 g. The right and, especially, left ventricles were markedly dilated. The prosthetic valve sutured on a ring was partially dislocated, and dehiscence was found along the original valve ring. The thinned posterior wall of the left ventricle with massive fibrosis suggested an old infarction and showed aneurysmal dilatation.

Intestines: Gross examination showed scattered mucosal erythema in the small and large intestines. Wall thickening with mild stricture was seen from the sigmoid colon to the rectum. Microscopic examination demonstrated moderate mucosal atrophy and submucosal fibrosis in the sigmoid colon and rectum. These changes were presumably the sequelae of ulcerative colitis. No active inflammatory lesions due to ulcerative colitis were seen.

Lungs: Both lungs were bulky (right, 515 g; left, 666 g). Gross examination of the cut surface of the lungs showed extensive consolidation with a loss of the fine spongy appearance (Fig. 3). Typical honeycomb lung was not seen. Histological examination demonstrated foci of alveolar wall thickening with lymphoid infiltration and type 2 pneumocyte proliferation distributed throughout both lungs (Fig. 4A). Immunohistochemical study revealed that the infiltrat-

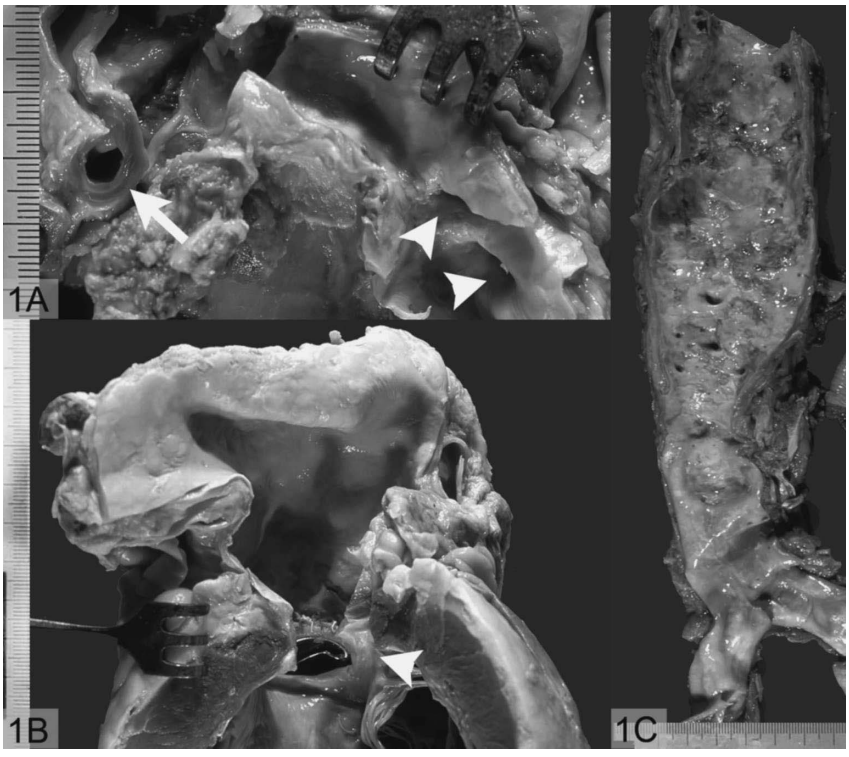

Fig. 1. Macroscopic findings of the aorta and heart. A, Aortic arch and branches : Cross section of the brachiocephalic trunk shows moderately thickened wall (arrow). The orifice of the left common carotid artery and the left subclavian artery are not severely stenosed (arrow heads). B, Heart : The ascending aorta is conspicuously dilated. The prosthetic valve (arrow head) sewn on a ring was partially dislocated and dehiscence is seen along the original valve ring. C, Lower part of descending aorta, abdominal aorta, and bilateral common iliac arteries : Dilation extends from the thoracic aorta down to branching point of the renal artery. Marked atherosclerosis is observed in the luminal surface of the aorta.

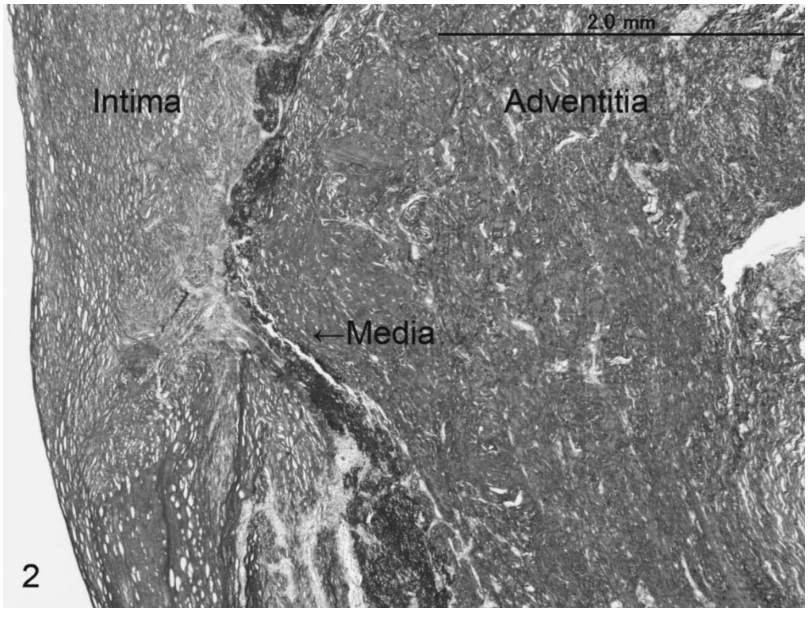

Fig. 2. Microscopic view of the aortic arch : Low magnification of Elastica van Gieson stained section shows disintegration of the media with elastic fiber clumping, thickened intima with atherosclerosis, and conspicuous fibrous thickening of the adventitia. No active inflammatory lesion is seen.

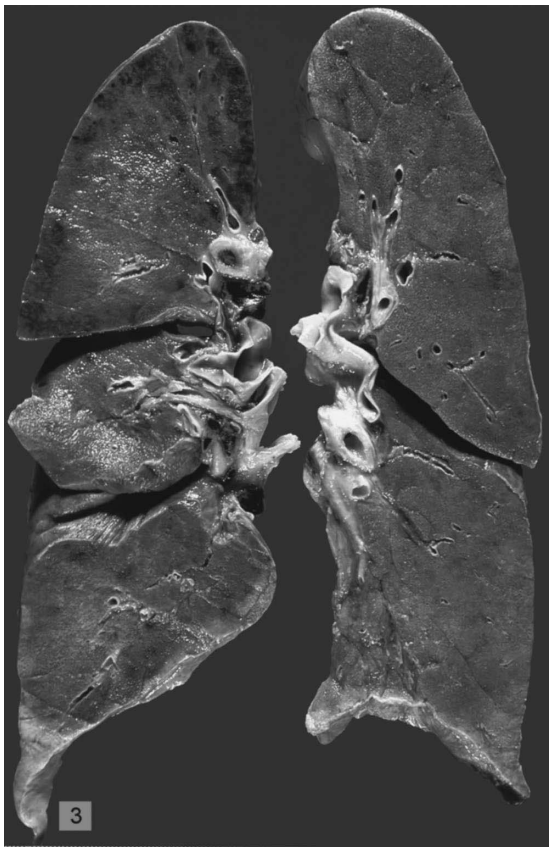

Fig. 3. Gross findings of the cut surface of the lungs show extensive consolidation with loss of fine spongy appearance.

ing lymphocytes were composed of a mixture of T and B cells. In a small part of the right lower lobe, microcystic honeycomb lung was observed (Fig. 4B). These pathologic changes were consistent with a diagnosis of nonspecific interstitial pneumonia.

In this patient, the paravalvular leak had clearly been caused by dehiscence of the prosthetic valve, resulting in aggravation of heart failure. Takayasu arteritis and ulcerative colitis were considered to have subsided because no active inflammatory lesion was found. Respiratory function was severely impaired, likely because of interstitial pneumonia and pulmonary edema. Heart failure was presumed to be the direct cause of death.

COMMENTS

Interstitial pneumonia, which was one of the causes of death in the present case, is a rare pulmonary complication of Takayasu arteritis. Takayasu arteritis is also known to be associated with pulmonary disease, and the pulmonary artery is involved in most cases[3]. On the other hand, to the best of our knowledge, only 4 cases of interstitial pneumonia associated with Takayasu disease have been reported,

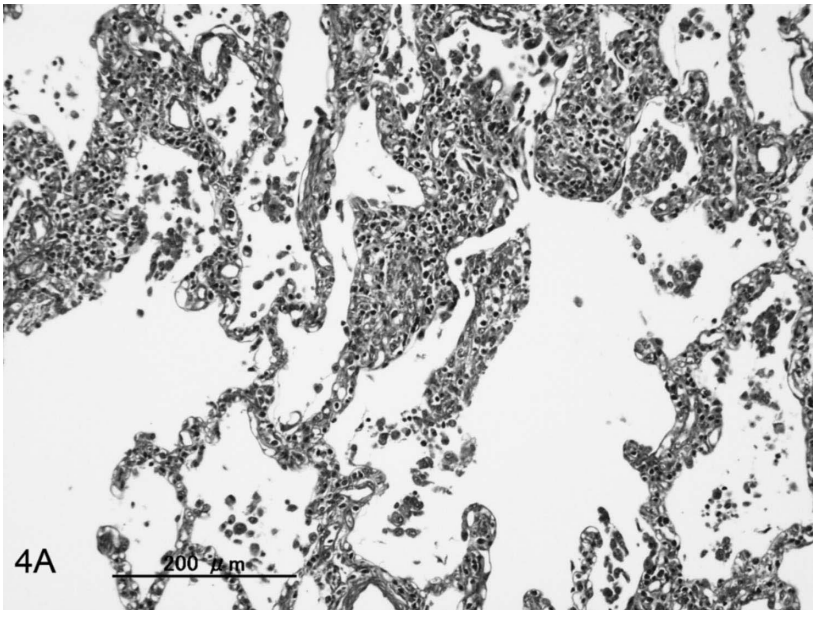

Fig. 4A

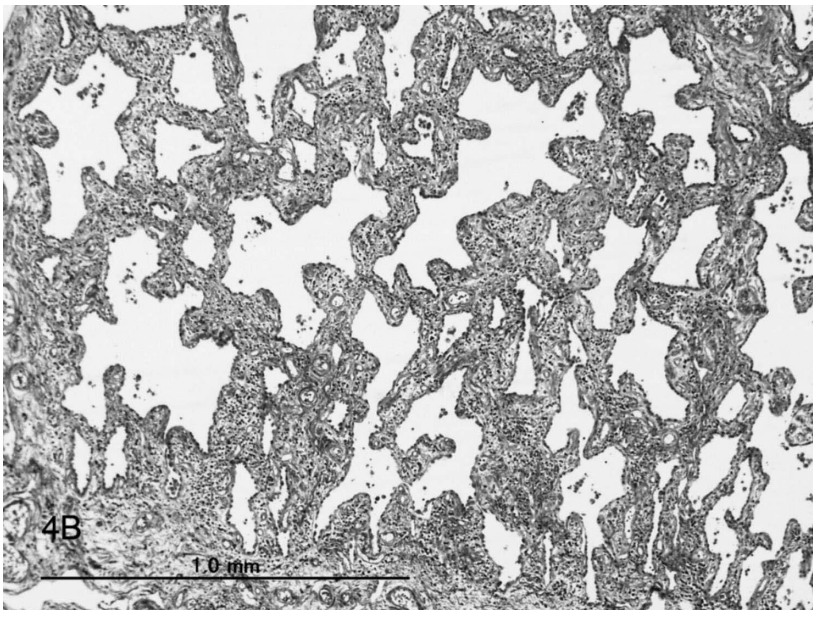

Fig. 4B

Fig. 4. Microscopic findings of the lung. A, Middle magnification of Masson trichrome stained section shows nonspecific interstitial pattern. Alveolar wall is thickened with lymphoid infiltration and type 2 pneumocyte proliferation. B, Low magnification of Masson trichrome stained section shows microcystic homey comb lung.

and the interstitial pulmonary diseases were usual interstitial pneumonia[4], acute interstitial pneumonia[5], nonspecific interstitial pneumonia[6], and diffuse interstitial pneumonia[7].

The etiology of most cases of nonspecific interstitial pneumonia is unknown. However, immunologic factors are thought to play a role in pathogenesis, based on the fact that some patients with nonspecific interstitial pneumonia have underlying collagen diseases. In addition, although the cause of ulcerative colitis is also unclear, immunological abnormality is strongly suspected to be involved.

Takayasu arteritis associated with ulcerative colitis has been reported, but the frequency is low. According to a report of the Research Committee of Inflammatory Bowel Disease in Japan[8], only 3 of 1,433 patients had concurrent Takayasu arteritis (0.21%). Forty cases of ulcerative colitis associated with Takayasu disease have been documented in Japan, including the cases described in recent reports[9]. However, Takayasu arteritis associated with both ulcerative colitis and interstitial pneumonia has not been previously reported. The association of these 3 diseases suggests that immunological mechanisms play an important role in the pathogenesis.

We have reported a rare case of Takayasu arteritis associated with ulcerative colitis and nonspecific interstitial pneumonia. This case strongly suggests that the 3 diseases share immunologic factors in their pathogenesis and pathophysiology.

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