CASE REPORTS

Severe Pulmonary Hypertension and Takayasu Arteritis

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Takayasu arteritis is an inflammatory disease that affects large vessels, especially the aorta and its branches. The clinical features of the disease depend on which arteries are affected. Although pulmonary artery involvement is common, only rarely is this the main clinical manifestation. We describe the case of a young woman with dyspnea who had severe pulmonary hypertension secondary to Takayasu arteritis of the pulmonary artery. She was administered corticosteroid (methylprednisolone) and immunosuppressant (azathioprine) therapy and a stent was implanted in the left pulmonary artery. Both hemodynamic and clinical signs improved.

Key words: *Takayasu arteritis. Pulmonary hypertension. Stent.*

Hipertensión pulmonar grave y enfermedad de Takayasu

La enfermedad de Takayasu es una enfermedad inflamatoria que afecta a los grandes vasos, especialmente la aorta y sus ramas. La clínica de la enfermedad depende de la distribución de las arterias afectadas. A pesar de que la arteria pulmonar se afecta de manera habitual, rara vez es ésta la principal manifestación clínica de la enfermedad. Se describe el caso de una paciente joven con clínica de disnea que presentaba hipertensión pulmonar grave secundaria a la afectación de la arteria pulmonar, que se trató con corticoides (metilprednisolona), inmunodepresores (azatioprina) y la implantación de un *stent* en la arteria pulmonar izquierda, tras lo cual presentó una notable mejoría tanto hemodinámica como clínica.

Palabras clave: *Enfermedad de Takayasu. Hipertensión pulmonar.* Stent.

Introduction

Takayasu arteritis, also known as pulseless disease, is an arteritis of the large vessels that commonly affects the aorta and its main branches. Clinical manifestations depend on which arteries are affected. Although pulmonary artery involvement is common, initial presentation as severe pulmonary hypertension is rare. We describe the case of a woman with Takayasu arteritis, pulmonary artery involvement, and severe pulmonary hypertension, whose condition partially resolved after stent implantation.

Clinical Observation

The patient was a 28-year-old woman with no substance abuse, with a history of pulmonary tuberculosis that had been treated for 6 months 5 years before she visited her primary care physician with a complaint of 6 months of exertional dyspnea, low-grade fever mainly at night, and chest tightness. The findings of lung function tests were normal and an electrocardiogram showed a right branch block as the only noteworthy finding. A chest x-ray showed a normal sized right pulmonary hilum and an ipsilateral hyperlucency. Contrast-enhanced computed tomography of the thorax revealed diffuse infiltration of the mediastinum, narrowing of the pulmonary arteries, and enlarged mediastinal lymph nodes. With an initial diagnosis of suspected fibrous mediastinitis, the patient was referred to our hospital for further evaluation. Physical examination disclosed a grade 3/6 systolic murmur in the aortic valve area with radiation to the carotid arteries, a weak right radial pulse, an absence of left radial pulse, and presence of femoral pulses. Echocardiography estimated pulmonary artery pressure to be 100 mm Hg. Right lung perfusion was scarcely visible in a ventilation-perfusion scintigraphy scan (Figure 1). Magnetic resonance angiography (Figure 2) showed stenosis of the thoracic aorta, the supraaortic branches, and the pulmonary artery—especially on the right side, where there was almost no flow. Such stenoses were indicative of Takayasu arteritis, group IIa, of the pulmonary artery. Treatment with methylprednisolone began at a dosage of 1 mg/kg/d, which had to be reduced owing to development of a marked Cushing response; azathioprine was then added. Although the patient's systemic manifestations improved, severe pulmonary hypertension persisted. She was therefore referred to a specialized center for evaluation of therapeutic options. It was decided to implant a stent only in the left pulmonary artery since the right one was too severely narrowed to admit passage of the stent guide. To date, the patient's post-surgical course with medical treatment has been favorable. From the time of onset of symptoms, 2 years elapsed until the time of this report.

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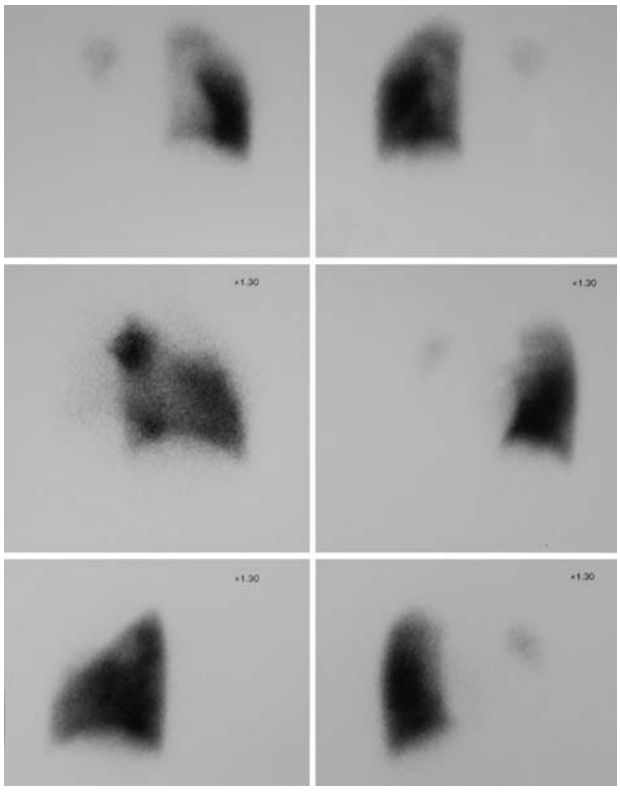

Figure 1. Lung perfusion scintography showing almost total absence of right lung perfusion.

Figure 2. Magnetic resonance angiography showing the affected aorta, its main branches, and the pulmonary arteries.

Discussion

Takayasu arteritis is a rare disease named after a Japanese ophthalmologist who, in 1905, described the case of a 21-year-old woman who presented arteriolovenular anastomosis in the retina of her eye. The incidence rates of Takayasu arteritis are relatively high in Japan, Southeast Asia, India, and Mexico.[1] The disease commonly affects women—especially those younger than 40 years of age. The course of the disease runs in 2 phases: the first is the preischemic phase, characterized by systemic symptoms, such as a general feeling of discomfort, fever, asthenia, sweating, and aching joints; the second, the ischemic phase, commonly appears years later and leads to ischemia in the region supplied by the affected artery.[1] The ischemic stage is characterized by decreased or absent pulse, cardiac murmur, systemic arterial hypertension, aortic valve insufficiency, neurological involvement, and pulmonary hypertension. There are no laboratory findings specific to Takayasu arteritis and a confirmed diagnosis is based on the histopathology of the vessel affected. However, given the obvious difficulty of obtaining such information, diagnostic criteria have been set forth. Of the various criteria available, in the present case we used those of the American College of Rheumatology[2]: patient's age less than 40 years at onset, claudication of extremities, decreased brachial artery pulse, systolic blood pressure difference between arms greater than 10 mm Hg, murmur over the subclavian arteries or aorta, and abnormal arteriographic findings. A confirmed diagnosis must be founded on a finding of at least 3 of the 6 criteria.

TABLE 1
New Angiographic Classification of Takayasu Arteritis (From the Takayasu Conference, 1994)

Type	Vessel Involvement
I	Branches from the aortic arch
IIa	Ascending aorta, aortic arch and branches
IIb	Ascending aorta, aortic arch and branches, descending thoracic aorta
III	Descending thoracic aorta, abdominal aorta, and/or renal arteries
IV	Abdominal aorta and/or renal arteries
V	Combined features of types IIb and IV

According to this classification system, involvement of coronary or pulmonary arteries is designated as C+ or P+, respectively.

Takayasu arteritis may be classified according to angiographic criteria (Table 1),[3] which include the location of disease in the aorta and its main branches and the various ways they can affect coronary and pulmonary arteries. The disease may also be classified according to clinical criteria (Table 2),[4] which include the presence and number of complications (or their absence). The 4 principle complications described by Ishihawa[4] are retinopathy, secondary arterial hypertension, aortic value regurgitation, and aneurysm formation; such complications determine prognosis since the absence of complications in Takayasu arteritis is associated with a 5-year survival rate of 100%, but survival is lower in cases of complicated disease. The

TABLE 2
Clinical Classification of Takayasu Arteritis (From Ishikawa[4])

Group	Clinical Features
I	Uncomplicated disease, with or without pulmonary artery involvement
IIA	Mild to moderate single complication together with uncomplicated disease
IIB	Severe single complication together with uncomplicated disease
III	Two or more complications together with uncomplicated disease

main cause of death in patients with complicated disease is cerebrovascular accident and heart failure.[5] The first-line treatment for Takayasu arteritis is administration of corticosteroids and immunosuppressants. Approximately half of patients respond well to treatment with systemic corticosteroids and, for those who do not, treatment should be initiated with immunosuppressants (the most common being methotrexate, although cases have been reported in which mycophenolate mofetil was administered).[1] Revascularization is an intervention that should be reserved for patients with renal-vascular hypertension or renal-artery stenosis, claudication of the extremities causing severe limitation, coronary or cerebrovascular disease, or aortic valve regurgitation; bypass techniques are more often recommended than percutaneous transluminal angioplasty, although cases in which angioplasty was successfully used have been reported.[6]

Lung involvement is common, at a prevalence of over 50% in patients diagnosed with Takayasu arteritis.[6-12] However, the literature, which consists mostly of reviews of specific cases, indicates that the main symptoms or even initial symptoms are rarely caused by an affected pulmonary artery as in the case we report. Some authors have postulated that pulmonary artery involvement is more common, the more the brachiocephalic arteries are affected[11]; however cases have been reported in which the pulmonary artery was the only diseased artery (thus fulfilling the diagnostic criteria for Takayasu arteritis with corroborating pathology).[8] Pulmonary artery involvement can be clinically asymptomatic (revealed when study is carried further in a diagnosed case of Takayasu arteritis), although it can occasionally present as pulmonary hemorrhage (rupture of collateral vessels, microaneurysms or hyperemic response)[10] or as chronic dyspnea accentuated during exercise, which sometimes leads to an erroneous diagnosis of thromboembolic disease[8,9] since angiographic findings can be identical for the 2 diseases. Therefore, in young patients with dyspnea suspected of pulmonary thromboembolism, the physician should systematically note palpation of peripheral pulses and measure blood pressure in both arms since the dyspnea may be the initial manifestation of Takayasu arteritis.[13] When there are no systemic signs, other diagnoses that may be confused with Takayasu arteritis are fibrous mediastinitis and congenital stenosis of the pulmonary artery.[8] Treatment of pulmonary artery disease follows the same criteria as treatment of systemic symptoms. Medication is the most common strategy and revascularization is reserved for the most severe and disabling cases. Cases have been reported of surgical reconstruction of the 2 stenotic branches of the pulmonary artery[14] and of percutaneous transluminal angioplasty with and without stent implantation,[15] all successful. Pneumectomy has even occasionally been required owing to secondary complications in the pulmonary artery (massive hemoptysis and cavitation of the unperfused lung).[9]

In conclusion, in the case of Takayasu arteritis reported herein, the patient's main symptom was severe pulmonary hypertension secondary to extensive involvement of the main pulmonary arteries. After a stent was implanted in the left main branch, symptoms improved markedly.

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