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Case Report

Congestive Heart Failure Revealing Takayasu's Disease: About Two Cases at the University Teaching Hospital of Brazzaville

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Abstract

Introduction: Takayasu's disease (TD) is a rare chronic large-vessel vasculitis of unknown etiology that preferentially affects the aorta and its branches. Clinical manifestations are usually dominated by ischemic and vascular signs, and cardiac involvement, although rare, marks an important turning point in the course of the disease.) We report two cases of TD that showed up as congestive heart failure. *Case presentations*: the first with a four-year history of heart failure previously attributed to hypertensive heart disease, and the second with acute pulmonary edema in the context of a one-year history of intermittent lower-limb claudication. Transthoracic echocardiography showed a dilated cardiomyopathy with severely reduced ejection fraction and moderate aortic and mitral regurgitation in the first patient, and concentric hypertensive heart disease with moderate aortic regurgitation in the second. CT angiography of the aorta and its branches showed arterial wall thickening and occlusive lesions of the supra-aortic and/or iliac arteries in both patients, raising suspicion of TD. The diagnosis was confirmed using the 2022 ACR/EULAR classification criteria, with scores of 6 and 12 points, respectively. Both patients received standard heart failure therapy together with oral corticosteroid therapy. The first patient also received an oral anticoagulant following a transient ischemic stroke and remains on the waiting list for vascular surgery. Clinical signs of heart failure regressed with treatment in both patients. *Conclusion:* Cardiac involvement can be the presenting feature of Takayasu's disease. This diagnosis should be considered in a young woman presenting with heart failure associated with blood pressure asymmetry or absent peripheral pulses, so as to enable earlier diagnosis and treatment.

Keywords

Takayasu's Disease, Heart Failure, Brazzaville

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1. Introduction

Takayasu's disease (TD) is a rare chronic large-vessel vasculitis. It mainly affects the aorta and its proximal branches, as well as the pulmonary artery [1]. It predominantly affects women under 40 years of age [2]. It is characterized by granulomatous inflammation of the vessel wall that progresses to wall thickening with fibrosis, leading progressively to stenosis, thrombosis, and sometimes aneurysm formation [3]. Clinical manifestations are variable and dominated by ischemic signs. Cardiac involvement is frequently reported, denotes disease severity, and constitutes a poor prognostic factor [4]. Cardiac involvement is rarely the presenting feature of TD. We report two cases of congestive heart failure revealing TD at the Brazzaville University Teaching Hospital.

2. Case Presentations

2.1. Case 1

Ms. N. G., a 25-year-old woman, had been followed in the cardiology department for heart failure attributed to hypertensive heart disease for 4 years. She had no notable history other than hypertension diagnosed 5 years earlier. She presented with a recurrence of global heart failure following an influenza-like illness. Clinical examination showed a good general condition, apyrexia at 36.8°C, absence of the left radial, ulnar, and brachial pulses, and a blood pressure of 95/70 mmHg in the left arm versus 160/100 mmHg in the right arm. Heart sounds were regular with a heart rate of 102 bpm. A protodiastolic gallop was present. Pulmonary auscultation revealed bilateral fine crackles. Laboratory tests showed an inflammatory syndrome with an erythrocyte sedimentation rate of 38 mm/h; the complete blood count was normal. Chest radiography showed cardiomegaly (cardiothoracic ratio 0.59) and bilateral interstitial opacities. The electrocardiogram showed sinus rhythm with left ventricular hypertrophy of the systolic overload type. Transthoracic echocardiography showed left ventricular dilatation (end-diastolic diameter 77 mm, i. e. 49 mm/m^2 indexed to body surface area) and left atrial dilatation (end-systolic area 28 cm^2), a reduced left ventricular ejection fraction of 27%, moderate aortic regurgitation, and grade 3 mitral regurgitation (Figure 1). The mitral and aortic valves were thickened and non-calcified. CT angiography of the supra-aortic trunks showed circumferential wall thickening of the left common carotid artery associated with thrombosis of the left subclavian artery (Figures 2 and 3). Treatment with loop diuretics, an angiotensin-converting enzyme inhibitor, a beta-blocker, and a mineralocorticoid receptor antagonist led to regression of the signs of heart failure. The clinical course was marked, one week later, by the sudden onset of a global and proportional left hemiplegia that resolved rapidly within 24 hours. Brain CT was normal. In addition to maintenance treatment for heart failure, she received corticosteroid therapy (prednisone 0.5 mg/kg), atorvastatin, and an oral anticoagulant. The patient is awaiting surgery.

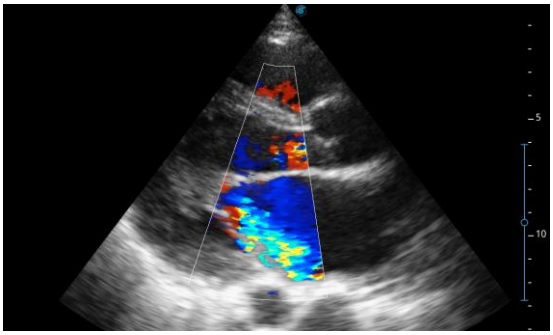

Figure 1. *Transthoracic echocardiography, parasternal long-axis view, showing mitral regurgitation on color Doppler (Case 1).*

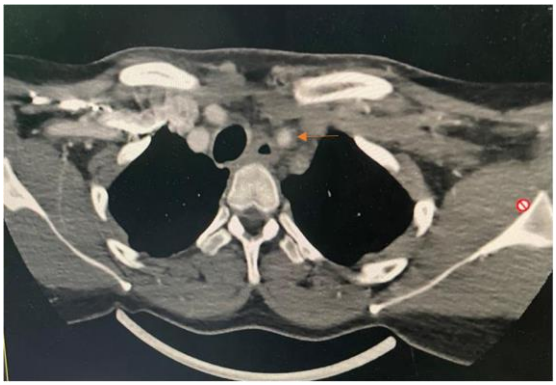

Figure 2. *Axial thoracic CT angiography showing stenosis of the common carotid artery and thrombosis of the left subclavian artery (Case 1).*

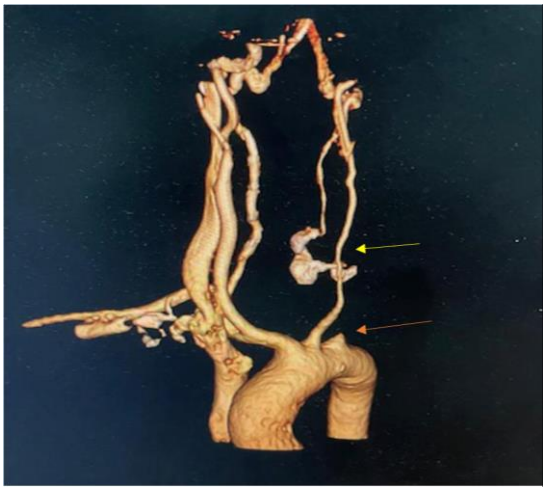

Figure 3. *CT angiography of the supra-aortic trunks, 3D reconstruction, showing stenosis of the left common carotid artery (yellow arrow) and thrombosis of the left subclavian artery (red arrow) (Case 1).*

2.2. Case 2

Ms. O. L., a 43-year-old woman, was admitted for management of acute pulmonary edema. Her history included intermittent claudication of the lower limbs for approximately one year. On examination, she had signs of respiratory distress with a respiratory rate of 35 cycles/min, oxygen desaturation to 85% on room air, bilateral absence of the pulses in both upper limbs, and diminished pulses in the lower limbs. Blood pressure was unrecordable in the left arm and 70/50 mmHg in the right arm. Heart sounds were regular at 105 bpm without added sounds. A left laterocervical bruit was noted, along with bilateral fine crackles extending upward. Laboratory tests showed an inflammatory syndrome (erythrocyte sedimentation rate 40 mm/h), anemia with hemoglobin of 10 g/dL, and a BNP level of 6500 pg/mL. Chest radiography showed cardiomegaly with bilateral alveolar opacities. The electrocardiogram showed regular sinus rhythm at 110 bpm with apicolateral repolarization abnormalities. Doppler echocardiography showed concentric left ventricular hypertrophy (end-diastolic septal and antero-lateral wall thickness of 12 mm), preserved left ventricular systolic function at 64%, and moderate aortic regurgitation (Figure 4). CT angiography of the supra-aortic trunks showed circumferential wall thickening of the aortic arch and the left subclavian artery, with occlusion of the left and right subclavian arteries (Figure 5). Abdominopelvic CT angiography showed severe stenosis of the right common iliac artery, the left internal iliac artery, and the ipsilateral external iliac artery, with occlusion of the proximal third of the left common iliac artery (Figure 6). Treatment included oxygen therapy, a loop diuretic, a nitrate, an angiotensin-converting enzyme inhibitor, an antiplatelet agent, a statin, and a corticosteroid. The clinical course was marked by resolution of the signs of heart failure after 6 days.

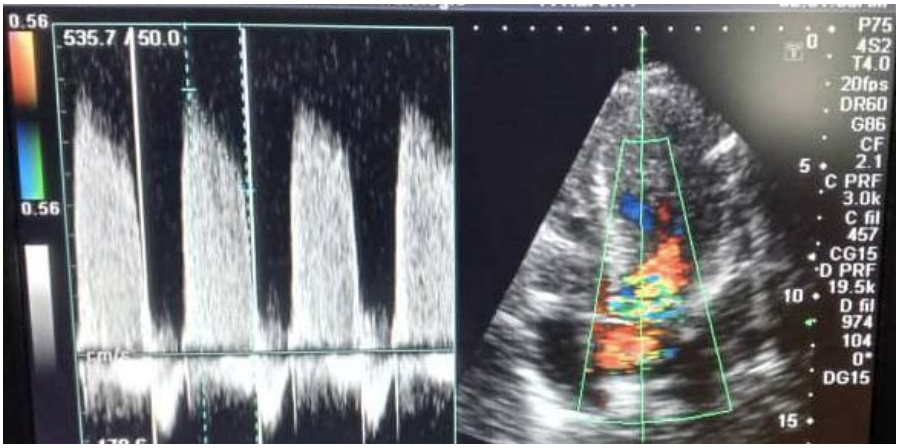

Figure 4. Transthoracic echocardiography, apical 4-chamber view, color and continuous-wave Doppler showing aortic regurgitation (Case 2).

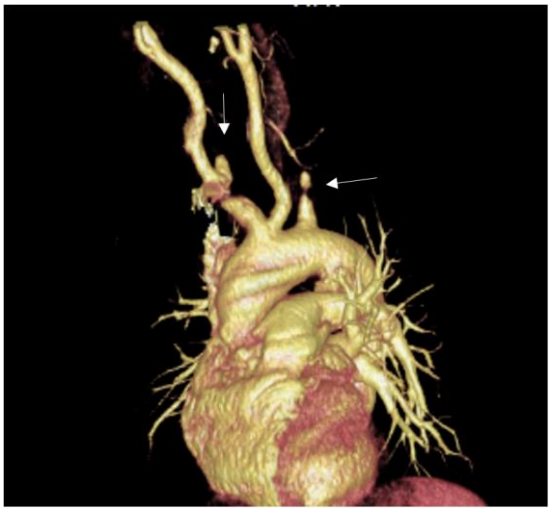

Figure 5. 3D Reconstruction of thoracic CT angiography showing bilateral occlusion of the right and left subclavian arteries on supra-aortic trunk angiography (white arrow) (Case 2).

Figure 6. Abdominopelvic CT angiography showing stenosis of the right common iliac artery (yellow arrow) and occlusion of the left common iliac artery (red arrow) (Case 2).

3. Discussion

First described in Japan, TD is ubiquitous but is observed with greater frequency in Asia, South America, and Mediterranean countries [5]. Its incidence in Western populations is 1.2 to 2.6 cases per million per year [6]. It is considered rare in sub-Saharan Africa, where diagnosis is often delayed [7, 8]. The etiology is unknown, but several hypotheses have been proposed, including infectious, genetic, or autoimmune origins [9]. TD progresses in two phases. The first, so-called pre-occlusive or systemic phase, is characterized by general signs such as fever and arthromyalgia, cutaneous signs, and a biological inflammatory syndrome. This phase often goes unnoticed and is a source of diagnostic error due to its non-specific signs [10]. The second, so-called vascular or occlusive phase results from arterial stenosis, manifesting as ischemic features. The diagnosis is most often made during this phase, as was the case in our patients. Although all the major arteries can be affected, the ascending and descending aorta, the subclavian arteries, and the extracranial arteries are the vessels most frequently involved, in 60 to 90% of cases [11]. According to the 2022 ACR/EULAR criteria [12], the first patient had a score of 6 points and the second a score of 12 points, both above the threshold of 5 points required to establish the diagnosis of TD. Hypertension is observed in 33 to 83% of cases and is one of the most common manifestations of TD [13]. In some situations, it can be difficult to detect because of frequent involvement of the subclavian arteries, which may be bilateral, as in the second patient. Hypertension in TD results either from renal artery stenosis or from arterial wall stiffness. It may sometimes result from a pseudo-coarctation of the aorta or from a widened pulse pressure in the presence of associated aortic regurgitation. Cardiac involvement is found in 30 to 40% of TD cases and is considered a marker of disease severity [14]. It includes hypertensive heart disease, aortic regurgitation, ischemic heart disease due to coronary artery involvement, and heart failure [8]. Direct myocardial involvement and pericardial effusions have also been reported [11]. In our patients, heart failure was of hypertensive origin. The frequency of heart failure in TD varies across series, ranging from 11 to 33% [4, 15]. Acute pulmonary edema has been reported in the literature as a presenting feature of TD [16], as observed in the second patient. Aortic regurgitation is the most frequent valvular involvement in TD, with a frequency of 62% [17]. It results from dilatation of the ascending aorta secondary to an aneurysm or from thickening with retraction of the aortic cusps. Given the frequency of rheumatic valve disease in sub-Saharan Africa, the diagnosis of TD with valvular involvement can be mistaken for a rheumatic flare [10]. Rare cases of mitral regurgitation in TD have been reported by some authors [11]. Coronary artery occlusion generally involves the proximal segments and is a frequent cause of mortality. Repolarization abnormalities on the electrocardiogram without angina were noted in Case 2. Neither of our patients underwent coronary angiography. The occurrence of ischemic stroke due to stenosis of the cerebral arteries has been frequently described in the literature [18]. However, a cardioembolic origin is more likely in our patient, given the coexistence of a severely hypokinetic dilated cardiomyopathy with an ejection fraction of 27%. In the absence of complications, the vital prognosis of TD is generally good. The main causes of death are heart failure, stroke, and renal failure [14]. In addition to treatment of heart failure, oral corticosteroid therapy, often combined with immunosuppressive treatment, is frequently required to control the vascular inflammatory process [19]. Endovascular or surgical revascularization improves long-term survival in patients at the chronic stage. It should be considered once the inflammatory phase has resolved [20]. The lack of medical infrastructure remains an obstacle to optimal management of patients in sub-Saharan Africa.

4. Conclusion

Cardiac involvement can be the presenting feature of Takayasu's disease, often in patients with vascular signs. Our two cases illustrate an uncommon but serious presentation of this disease, namely congestive heart failure. In our resource-limited setting, strengthening diagnostic and treatment capacity is essential to facilitate early diagnosis and management, in order to improve prognosis.

Table 1. *2022 ACR/EULAR classification criteria for Takayasu arteritis.*

Criteria	Case 1	Case 2
Female sex	+1	+1
Claudication of the lower limbs	-	+2
Angina	-	-
Arterial bruit	-	+2
Decreased/absent upper-limb pulse	+2	+2
Blood pressure difference ≥ 20 mmHg	+1	+1
Decreased/tender carotid pulse	-	-

Criteria	Case 1	Case 2
Number of arterial territories involved (1 territory = +1; 2 territories = +2; 3 territories = +3)	+2 (2 territories)	+3 (3 territories)
Bilateral involvement	-	+1
Involvement of the abdominal/renal/mesenteric aorta	-	0

Abbreviations

TD	Takayasu's Disease
ACR/EULAR	American College of Rheumatology / European Alliance of Associations for Rheumatology
CT	Computed Tomography
BNP	B-type Natriuretic Peptide

Author Contributions

Bakekolo Rog Paterne: Writing – original draft, writing-review & editing

Kouala Landa Christian Michel: Writing – review & editing

Mongo Ngamami Solange Flore: Writing – review & editing

Ellenga Mbolla Bertrand Fikahem: Visualization

Conflicts of Interest

The authors declare no conflicts of interest

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