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A Rare Clinical Case of Multivessel Stenosis and Lesions in Patient with Takayasu's Disease

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Abstract

Takayasu's disease is a systemic, inflammatory autoimmune disease. This disease is more often affecting young or middle-age women of an Asian descent. It predominantly affects the aorta and its branches, as well as the pulmonary arteries.

Keywords: Takayasu's disease; Multivessel lesions; Vascular ultrasound diagnostics

Introduction

Takayasu's disease, also known as Takayasu arteritis, is a form of large vessel granulomatous vasculitis with massive intimal fibrosis and vascular narrowing. This disease is more often affecting young or middle-aged women of an Asian descent. It predominantly affects the aorta and its branches, as well as the pulmonary arteries. In terms of prevalence, females are about 8 to 9 times more likely to be affected than males [1].

Takayasu's disease is similar to other forms of vasculitis, including giant cell arteritis which typically affects older individuals [1,2]. Due to obstruction of the main branches of the aorta, including the left common carotid artery, the brachiocephalic artery, and the left subclavian artery, Takayasu's arteritis can present as pulseless upper extremities with weak or absent pulses on the physical examination, which may be why it is also commonly referred to as the "pulseless disease" [3].

Although the cause of Takayasu arteritis is unknown, the condition is characterized by segmental and patchy granulomatous inflammation of the aorta and its major derivative branches. This inflammation leads to arterial stenosis, thrombosis, and aneurysms [3]. There is irregular fibrosis of the blood vessels due to chronic vasculitis, sometimes leading to massive fibrosis of the inner section of the blood vessels (intima fibrosis) [3].

Clinical features of this disease can be detected on physical vascular examination of lower extremities by assessing pulses and confirmed by ultrasonography. Diagnosis is based on the demonstration of vascular lesions in large and middle-sized vessels on angiography, CT scan,

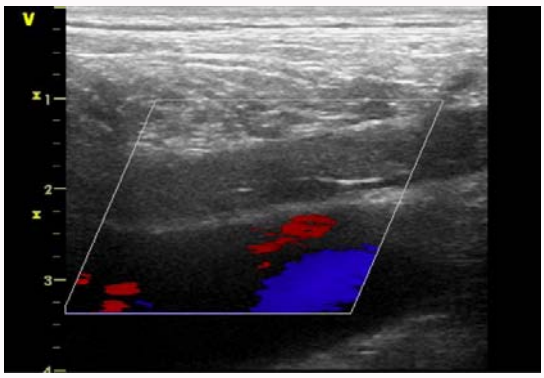

Figure 1: Occlusion of 50 mm with homogenous masses of medium echogenicity, which firmly adhered to the vessel wall, detected in the right common iliac artery by ultrasonography.

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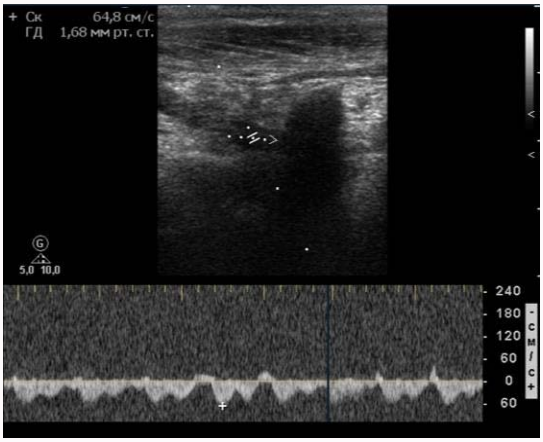

Figure 2: Steal syndrome was diagnosed based on retrograde blood flow in vertebrate artery (shown by white arrowhead) and detected by ultrasound at 60 cm/second.

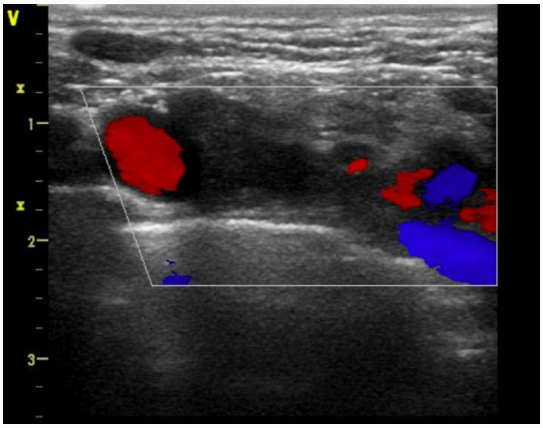

Figure 3: Occlusion of the first segment of subclavian artery as detected by ultrasonography.

Magnetic Resonance Angiography (MRA). Contrast angiography has been the gold standard. However, angiography provides information on vessel anatomy and patency but does not provide information on the degree of inflammation in the wall [2,3].

Ultrasonography remains a primary imaging modality to diagnose vascular diseases, including Takayasu's arteritis. It is cost efficient and minimally invasive, since it doesn't require use of contrast agents, and/or anesthesia related to intervention [2,3]. The earliest detectable on ultrasound lesion is a local narrowing or irregularity of the lumen. This may develop into stenosis and occlusion. The characteristic finding is the presence of "skip lesions," where stenosis or aneurysms alternate with normal vessels. If such lesions are detected, further evaluation on CT scan or MRA is recommended [2,3].

Purpose

To analyze and describe a rare clinical case of multivessel stenosis and lesions in Takayasu's disease of a 35 years old man.

Material and Methods

The patient was examined by utilizing stationary device Philips HD 11 expert class with phased sectoral sensor at 2 MHz to 4 MHz frequency at the Ultrasonic and Functional Diagnostics Department of the Mirotvortseva hospital, which is affiliated with Saratov State Medical University (SSMU).

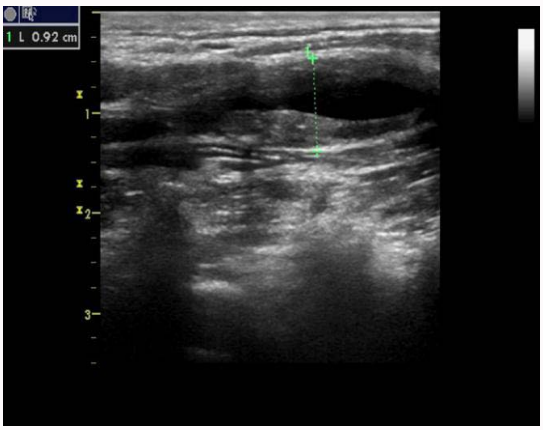

Figure 4: Bifurcation of common carotid artery. A diffused thickening of the right common carotid artery walls, which was circular in shape (shown in dotted line) as detected by ultrasound. The maximum stenosis detected by ultrasonography was up to 60%.

Results

The 35-year-old man, who lives in the Saratov region, was referred by a general surgeon to the Mirotvortseva hospital. The patient had complaints of pain in the right leg shin, which appeared after walking about 100 m. The onset of the disease was 3 months prior according to the patient, when discomfort in the lower limb arose after walking on average 450 m. The patient had asthenic physique, without bad habits and chronic diseases. On physical examination there was no pulsation on the femoral, popliteal and tibial arteries on the right side, and only weak pulsations on the right radial artery was detected.

The triplex ultrasound scanning showed a 50 mm occlusion of the right common iliac artery (Figure 1). There were homogenous masses of medium echogenicity, which firmly adhered to the vessel wall. The differentiation into layers was lost in the vessel (Figure 1). There was a collateral blood flow detected and thickness of the intima-media complex was measured at no more than 0.65 mm in distal levels of right limb's arteries. As for the left limb, there were no pathological changes seen on ultrasound and physical examination. When we checked the brachiocephalic arteries, we found vertebral subclavian steal syndrome (as shown on Figure 2) with occlusion of the first segment of the subclavian artery (Figure 3), and diffused thickening of the walls of the right common carotid artery, which was circular in shape (Figure 4). The maximum stenosis detected was up to 60% in the bifurcation of carotid artery (Figure 4). There were no pathological changes found in the left branches of the aortic arch, and the intima-media complex was measured at up to 0.65 mm (not shown). The abdominal aorta and visceral branches were also examined. The walls were not thickened; the blood flow was without changes. The celiac trunk was not affected (not shown). According to clinical and laboratory tests (e.g., normal coagulation and lipid spectrum, insignificant increasing of the blood sedimentation rate and C-reactive protein), relatively young age (35 years old), complaints of intermittent claudication, weak pulsation on the radial artery, and the presence of close relatives with Asian heritage which associated with genetic predisposition, the patient's diagnosis was determined to be the Takayasu's disease.

Conclusion

When identifying a non-atherosclerotic profile in young patients

with the symptoms of intermittent claudication with occlusive lesions in the lower limbs, we recommend performing an ultrasound examination of brachiocephalic arteries for excluding the multivessel lesions involvement, which can be a sign of rarer incidence of an advanced and dispersed in different parts of the body Takayasu's disease.

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