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A Case of Asymptomatic Brachial Artery Stenosis

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Abstract: To report a case of a patient with brachial artery stenosis and undiagnosed severe hypertension, who developed transient ischemic attack. A 51-year-old current smoker, obese male patient was admitted to our hospital with severe dizziness, vertigo, unilateral weakness in lower limb, loss of balance, nausea and vomiting. Patient had positive family history of hypertension and stroke from paternal as well as maternal sides. Patient through years was considered as a normotensive according to the blood pressure measurements at the doctor's office and at home. Blood pressure used to be taken on the left hand exceptionally. While checking his blood pressure after the accident, appeared a big difference between hands, namely 210/110 mmHg on the right hand and 120/80 mmHg on the left. Upper-extremity vascular stenosis is extremely uncommon pathology and brachial artery involvement is reported in about 5 to 12% of all the cases. A diameter reduction of 50% or a cross-sectional area reduction of 70%, represents a hemodynamically significant lesion, which leads to the pressure drop across the stenotic area. If blood pressure is not measured on both hands, arterial hypertension can be easily missed, like in our clinical case. In spite of in current arterial hypertension management guidelines do not indicate how often should be rechecked blood pressure simultaneously on both hands, depending on our case we can suggest, that there is a high necessity of blood pressure measurement on both arms time to time for ruling out possible stenosis of subclavian or brachial arteries and "false normotension". We think that Arterial Hypertension Management Guidelines should recommend the time period, when it is mandatory to recheck blood pressure simultaneously on both hands.

Keywords: Brachial artery stenosis, arterial hypertension, cardiovascular risk, cerebrovascular risk.

INTRODUCTION

Brachial artery stenosis is a fascinating vascular phe¬nomenon in which a steno-occlusive lesion of brachial artery leads to the significant difference of blood pressure between arms. Most commonly this phenomenon presents as an incidental finding. The majority of patients are asymptomatic [1]. Incidence of the brachial artery stenosis is less than 5% on the population level [2]. Symptomatic brachial arterial occlusive disease is extremely rare because of the abundant collateral network and uncommon localization of atherosclerotic process in the upper extremity; however, symptomatic patients typically pres¬ent with Raynaud's phenomenon and complain about coldness, weakness and numbness in the affected hand [3].

Diseases that affect the brachiocephalic vessels include atherosclerosis, fibromuscular dysplasia, arteritis, trauma, and congenital anomalies. Most common cause of brachial artery stenosis in the world is trauma, whereas atherosclerosis and Takayasu arteritis mainly affect subclavian artery. Vascular injuries accompanying upper-extremity trauma are considered to be rare and the brachial artery is injured most frequently. In literature there is a scarce data regarding brachial artery damage due to the blunt trauma [4, 5].

Angiography used to be the preferred diagnostic tool until ultrasound diagnostics was developed. Nowadays duplex ultrasound is considered as an effective, noninvasive method, which evaluates stenosis and occlusion of upper extremity blood vessels and is a cheaper, more simple and comfortable procedure for the patient [6].

We report a case of a patient, with brachial artery stenosis, vertebrobasilar insufficiency and undiagnosed severe hypertension, who developed transient ischemic attack (TIA).

CASE REPORT

Patient background

51-year-old-male patient, born and living in Georgia, with body mass index of 32.8 kg/m2 was admitted to our hospital with severe dizziness, vertigo, unilateral weakness in lower limb, loss of balance, nausea and vomiting. For publication presented clinical case local ethical committee permission was obtained. Patient was a current heavy smoker (20 cigarettes/day) with at least a 180 pack-year history of smoking for more than 30 years. Patient used to take alcoholic drinks 2-3 times per week. He was not diagnosed as having arterial hypertension, therefore was not on an antihypertensive treatment. Despite his past medical history of dyslipidemia, he denied to take medications to control lipid profile. His family history of hypertension and stroke was significant. Both, mother and father had severe arterial hypertension. Cause of death in both cases was stroke; mother died in 74 years old age and father when he was 58 years old.

During past decades patient several times visited family doctor's office because of non-cardiac diseases (flue, gastritis, allergy etc). Generally he did not have any particular complains, except of numbness and weakness in his right forearm after physical work, which appeared about 10 months ago. He linked these complaints to the heavy physical work, which he was not used to. The first recorded routine blood pressure measurement at family doctor's office which patient presented to our office was performed 5 years ago, on both hands, where blood pressure was slightly elevated and difference between the hands did not appear. Afterwards, occasional home as well as office blood pressure measurements were performed only on non-dominant hand and blood pressure never was out of normal range.

Clinical Details

In November 20017, after the typical working day the patient suddenly developed dizziness and vertigo ("the room was spinning") while getting up out of his chair, felt unilateral weakness in lower limb, lost his balance, became nauseated and vomited on the living room floor. He was able to call out for the help, but when his wife came in from the next room she noticed that he had coarse tremor in hands, his speech was slurred and hard to understand. She called emergency.

The emergency medical team arrived about 25 minutes later. While checking his blood pressure appeared a big difference between hands, namely 210/110 mmHg on the right hand and 120/80 mmHg on the left hand. Emergency team gave hypotensive agents to the patient and took him to the local hospital. Patient began to improve in the ambulance. By the time reached the emergency room he was speaking more clearly with mild dysarthria and could sit up. On examination his right hand in comparison with the left one was slightly paler and cooler. Physical examination revealed very difficult to feel, threadlike pulse on right radial artery and normal pulse on left radial artery. Heart rate was 72 bpm and cardiac auscultation revealed a 2/6 systolic ejection murmur over the right base. No carotid bruits were noted. Lungs were clear to auscultation. Pulses in lower extremities were intact. Patient was undergone to the blood tests, namely, complete blood count, erythrocyte sedimentation rate, serum electrolyte levels, renal function and coagulation studies, which did not show any disturbances. Mixed hyperlipidemia appeared while checking of lipid profile. C-reactive protein was slightly increased. Other diagnostic studies included 12-lead ECG that demonstrated sinus rhythm with no ST segment or T wave abnormalities. Transthoracic echocardiography was performed to exclude a cardioembolic source, foramen ovale etc of a cerebrovascular incident. Finger-stick blood glucose was in normal range (5.2 mmol/L). Noncontrast cranial CT was performed after 2 hours of symptom onset, where did not appear findings characteristic for acute direct and indirect focal lesions of the brain. After 4 hours from the onset of an acute ischemic attack, patient fully recovered and all the symptoms characteristic for vertebrobasilar insufficiency and posterior circulation ischemia disappeared. Diagnosis of TIA in vertebrobasilar territory was stated.

After discharge from the hospital patient underwent to the doppler ultrasonography of pre-cerebral arteries and upper limbs (see figure 1).

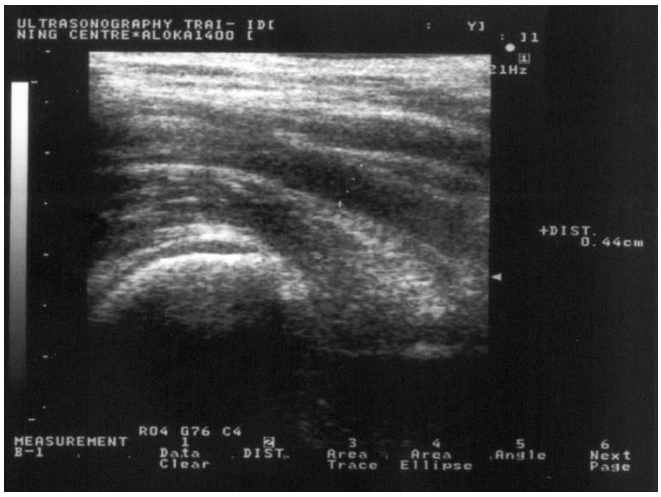

Fig-1: Ultrasonographic picture of the right and left brachial arteries

Recommendations for lifestyle modification, namely smoking cessation and avoiding alcohol abuse, were given to the patient. After discharge from the hospital prescribed medical treatment was as follows: Perindopril 10mg, Amlodipin5mg, Clopidogrel 75 mg, Rosuvastatin 20mg. Patient was advised to perform angiography with possible stenting for brachial artery stenosis.

DISCUSSION

Upper-extremity vascular stenosis is extremely uncommon pathology and reportedly involve the brachial artery in about 5 to 12% of such chronic limb ischemia cases [7, 8]. Upper-extremity trauma, fibromuscular dysplasia, giant cell arteritis, and atherosclerosis are among the causes [9]. Patients who present with upper extremity ischemia range from young adults with non-atherosclerotic causes to elderly patients with atherosclerosis. The brachial artery is also the most commonly injured artery in civilian trauma (30% of all arterial injuries). A diameter reduction of 50% or a cross-sectional area reduction of 70%, represents a hemodynamically significant lesion. These lesions produce a pressure drop across the stenotic area.

The cause of brachial artery disease for our patient was unclear. We had no reason to suspect fibromuscular dysplasia or giant cell arteritis in this patient. We believe that the cause of the brachial artery stenosis in this patient could be more likely trauma. Moreover, taken into account his history of dyslipidemia, possible hypertension and family history of cerebro-vascular events, atherosclerosis could be suspected.

Family doctor of our patient on the very first visit measured blood pressure on both hands followed by unilateral measurement on the left hand during the following visits. Consequently, because of existing right-sided brachial artery stenosis patient remained undiagnosed and untreated for arterial hypertension; hence, his risk was not properly assessed.

In the arterial hypertension management guidelines it is stated, that “blood pressure should be measured in both arms at first visit to detect possible differences. In this instance, should be taken the arm with the higher value as the reference”, therefore it is not indicated how often should be rechecked blood pressure simultaneously on both hands, even when physician is the same.

Depending on our case we can suggest, that there is high necessity of blood pressure measurement on both arms time to time for ruling out possible stenosis of subclavian or brachial arteries and “false normotension”. We think that Arterial Hypertension Management Guidelines should recommend the time period, when it is mandatory to recheck blood pressure simultaneously on both hands.

In people who have a TIA, the incidence of subsequent stroke is as high as 11% over the next 7 days and 24-29% over the following 5 years. Therefore, proper treatment to lower the risk of stroke has the highest importance. Blood pressure lowering therapy is considered as a pivotal in the primary and secondary prevention of stroke, especially in patients with a known history of cerebrovascular disease irrespective of blood pressure levels [3, 4]. Consequently, our patient was prescribed antihypertensive agents with proven efficacy of cerebrovascular complications.

CONCLUSIONS

Arterial hypertension is considered as a very common and strong risk-factor for cardio- and cerebrovascular mortality and morbidity. Early detection and proper control of hypertension has mandatory meaning for primary and secondary prevention of cardio- and cerebrovascular complications.

Current guidelines recommend blood pressure measurement on both arms while first visit of a patient

to the doctor, but nothing is said how often should be it repeated. Clinical practice shows, that quite often doctors use one and the same hand for blood pressure control for years. Hence, while existing unilateral brachial artery stenosis, existence of arterial hypertension can be missed. We strongly recommend rechecking blood pressure on both hands simultaneously at least once in a year to avoid clinical errors in blood pressure assessment and future management.

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