Forty-two-year-old female patient with resistant hypertension, bilateral renal fibromuscular dysplasia and intracranial aneurysm

Anna M. Kaszuba1, Aleksander Prejbisz1, Jacek Kądziela2, Urszula Ambroziak3, Małgorzata Szczerbo-Trojanowska4, Andrzej Januszewicz1

1Department of Hypertension, Institute of Cardiology, Warsaw, Poland
2Department of Interventional Angiology, Institute of Cardiology, Warsaw, Poland
3Department of Internal Medicine and Endocrinology, Medical University of Warsaw, Warsaw, Poland
4Department of Interventional Radiology and Neuroradiology, Medical University of Lublin, Lublin, Poland

We present a case of a 42-year-old woman with 1-month known history of resistant hypertension. On admission the patient’s blood pressure was 230/123 mm Hg and during the subsequent days ranged from 165/103 to 157/97 mm Hg (24 h ambulatory blood pressure values (ABPM) 151/102 mm Hg) despite taking 4 antihypertensive drugs (nebivolol 5 mg, amlodipine 10 mg, clonidine 375 μg and indapamide 1.5 mg). Physical examination revealed no abnormalities. Malignant hypertension was diagnosed based on grade III fundoscopy. Laboratory data showed normal serum potassium, creatinine and estimated glomerular filtration rate (eGFR), hemoglobin and platelet count. Urine analysis showed no abnormalities. Electrographic (ECG) and echocardiographic examinations were normal. The patient had two complicated pregnancies and one miscarriage. Doppler ultrasonography revealed bilateral, significant renal artery stenosis (RAS) with renal-aortic ratio (RAR) > 6 on the right side and RAR 4 on the left side, confirmed in computed tomography angiography (angio-CT). Invasive angiography revealed typical multifocal fibromuscular dysplasia (FMD) morphology (“string of beads” appearance) with at least 2 significant lesions of the main right renal artery trunk and also multifocal FMD lesions of left renal artery, with a significant lesion in the central region of the trunk (Figures 1 A and B). Multilevel balloon angioplasty of both arteries was performed, with good final flow, without significant residual stenosis (Figures 2 A and B).

Angio-CT of carotid and vertebral arteries showed an irregular small aneurysm (2 × 2 × 2.5 mm) of the left internal carotid artery (ICA) in the C 4 segment (Figure 1 C). Other intracranial arteries were normal.

Further evaluation of the left ICA aneurysm required angiography, which confirmed left ICA aneurysm: sac (6.07 × 1.99 mm), neck 1.79 mm (Figure 1 C). No other vascular abnormalities were found in other vascular beds on angio-CT. As an irregular aneurysm with the sac bigger than 5 mm requires treatment in a patient with hypertension, the patient was offered endovascular exclusion of an aneurysm using the stent-assisted coiling technique.

In 6-month follow-up a significant decrease in blood pressure was observed and the number of antihypertensive drugs was reduced. Twenty-four h ABPM was 119/80 mm Hg while staying on 2 antihypertensive drugs (nebivolol 5 mg, amlodipine 5 mg). On Doppler ultrasonography bilateral non-significant RAS with RAR 1.5–2 was observed.

Fibromuscular dysplasia is a nonatherosclerotic, non-inflammatory vascular disease that may involve multiple vascular beds and may result in arterial stenosis, occlusion, aneurysm or dissection [1]. Fibromuscular dysplasia lesions most commonly involve the renal arteries, which manifests clinically as hypertension. In our middle-aged patient with relatively sudden onset and short duration of symptoms, hypertension was drug-resistant and based on eye fundus examination – malignant. Revascularization by percutaneous transluminal angioplasty (PTA) resulted in blood pressure (BP) control improvement [2].

The US FMD Registry identified that cerebrovascular FMD was as common as renal FMD and a large number of

Corresponding author:
Anna M. Kaszuba, Department of Hypertension, Institute of Cardiology, 42 Alpejska St, 03-982 Warsaw, Poland, phone: +48 795 547 664, e-mail: anja.kaszuba@gmail.com
Received: 20.09.2016, accepted: 30.09.2016.
patients had FMD in multiple vascular beds. Aneurysms of carotid arteries are found in 17% of patients [3].

Our case supports that in patients with FMD in one vascular bed a high index of suspicion should be raised for diagnosis of FMD and/or vascular complications in other vascular beds [4].

**Conflict of interest**

The authors declare no conflict of interest.
Figure 2. A – Right renal artery after percutaneous balloon angioplasty therapy, B – left renal artery after percutaneous balloon angioplasty therapy

References

1. Tekieli ŁM, Maciejewski DR, Dzierwa K, et al. Invasive treatment for carotid fibromuscular dysplasia. Postep Kardiol Interw 2015; 11: 119-25.
2. van Twist DJ, Houben AJ, de Haan MW, et al. Renal hemodynamics and renin-angiotensin system activity in humans with multifocal renal artery fibromuscular dysplasia. J Hypertens 2016; 34: 1160-9.
3. Olin JW, Froehlich J, Gu X, et al. The United States Registry for Fibromuscular Dysplasia: results in the first 447 patients. Circulation 2012; 125: 3182-90.
4. Persu A, Giavarini A, Touzé E, et al. European consensus on the diagnosis and management of fibromuscular dysplasia. J Hypertens 2014; 32: 1367-78.