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STUDIUM PRZYPADKU / *CLINICAL VIGNETTE*

An electrophysiological approach using 3D electroanatomical mapping system for catheter--based renal denervation: the first Polish experience

Denerwacja nerek metodą elektrofizjologiczną za pomocą systemu 3D mapowania elektroanatomicznego: pierwsze polskie doniesienie

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We present the case of a 49-year-old male patient with hypertension, coronary artery disease, diabetes mellitus type 2, hyperuricemia and dyslipidaemia. The patient had a history of multiple coronary stenting and previous ischaemic stroke. Despite chronic therapy with six antihypertensive drugs (metoporolol succinate 100 mg, valsartan 160 mg, torasemide 10 mg, spironolactone 25 mg, doxazosinum 8 mg, nitrindipine 20 mg) his arterial blood pressure (BP) remained still elevated (Table 1). He presented frequent episodes of headache, dizziness, and syncope and was also hospitalised due to episodes of hypertensive crisis. The set of endocrinology tests and renal angiography excluded secondary causes of hypertension. Additionally, the scan revealed anatomy of renal arteries favourable for catheter-based renal denervation. Due to highly symptomatic and drug resistant hypertension, the patient was referred for an invasive treatment option as an adjunctive therapy.

The procedure was performed in the electrophysiological laboratory. Arterial BP was continuously monitored with a Finometer Pro device (Finapres Medical Systems BV, Amsterdam, The Netherlands). Initially an angiography of the right and left renal arteries was performed through transfemoral access (Fig. 1). Subsequently, the patient underwent 3D electroanatomical mapping (CARTO 3 electroanatomical mapping system, Biosense Webster, Inc., Johnson & Johnson, Diamond Bar, CA, USA) of the aorta and both renal arteries (Fig. 2). Before radiofrequency (RF) current application, we paced 10 s 20 Hz (10 mA/2 ms) burst sequence using a mapping catheter (Navistar Thermocool, Johnson & Johnson) at the ostia of each renal artery as described by Pokushalov et al. (J Am Coll Cardiol, 2012; 60: 1163–1170). Immediately after pacing, a rise of arterial BP was observed (Fig. 3). Afterwards, under intravenous analgesia (midasolam and fentanyl), applications of RF energy (7–8 W; 95–120 s) were delivered in two points in the left renal artery and in four points in the right renal artery (Fig. 2). Subsequent renal arteriography revealed neither stenosis nor dissection. The further in-hospital observation was uneventful.

Herein, we present the first Polish experience with renal denervation performed with the electrophysiological method using 3D electroanatomical mapping. This procedure was part of a research project approved by the Ethics Committee, Medical University of Lodz, Poland.

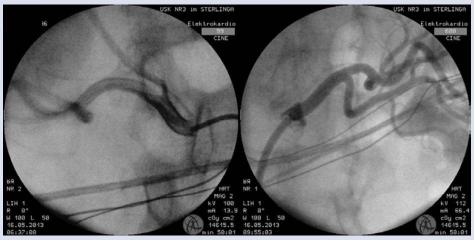

Figure 1. Angiography of right renal artery and left renal artery

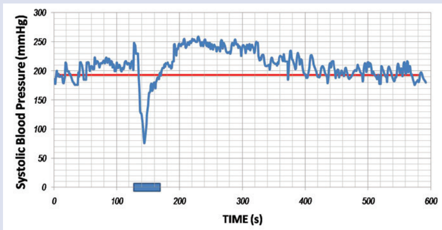

Figure 3. Systolic blood pressure (SBP) before and after pacing in the ostium of the left renal artery. The red line reflects mean SBP of last 3 min before pacing. The blue mark on the time axis stands for the period of burst pacing

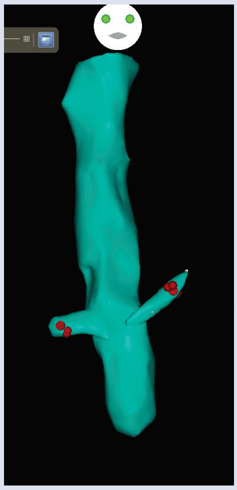

Figure 2. 3D reconstruction acquired with CARTO 3 electroanatomical mapping system

Table 1. Arterial blood pressure measurements

In-office systolic BP	In-office diastolic BP	Mean systolic BP in ABPM	Maximum systolic BP in ABPM	Minimum systolic BP in ABPM
205	105	150	210	137

Values expressed in mm Hg; BP — arterial blood pressure; ABPM — 24-hour ambulatory blood pressure monitoring

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