Clinical case

UDC 616.12-008.331.1:616.45-091.8-006-071.1

PASSIONS AROUND PHEOCHROMOCYTOMA

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A clinical case of arterial hypertension (AH) in patient with family history of pheochromocytoma is described. Patient has no classical clinical signs and imaging phenotype of pheochromocytoma, but there are a number of warnings – family history of pheochromocytoma, prevalence of humoral-metabolic regulation and reduced reaction to the respiratory test, CT-signs of nodular hyperplasia of left adrenal gland – which may indicate its possible manifestations in the future, and therefore the monitoring is required.

KEY WORDS: arterial hypertension, pheochromocytoma, clinical case

ПРИСТРАСТІ НАВКОЛО ФЕОХРОМОЦИТОМИ

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Описаний випадок артеріальної гіпертензії (АГ) у пацієнта з сімейним анамнезом феохромоцитоми. У пацієнта відсутні класичні клінічні симптоми цього захворювання, а також характерні для феохромоцитоми зміни на комп'ютерній томограмі (КТ). Однак виявлено ряд ознак, які свідчать про її можливий розвиток в майбутньому – обтяжена по феохромоцитомі спадковість, переважання гуморально-метаболічної регуляції і знижена реакція на дихальну пробу, КТ-ознаки нодулярної гіперплазії лівого надниркика, у зв'язку з чим пацієнт потребує спостереження.

КЛЮЧОВІ СЛОВА: артеріальна гіпертензія, феохромоцитома, клінічний випадок

СТРАСТИ ВОКРУГ ФЕОХРОМОЦИТОМЫ

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Описан случай артериальной гипертензии у пациента с семейным анамнезом феохромоцитомы. У пациента отсутствуют классические клинические симптомы этого заболевания, а также характерные для феохромоцитомы изменения на компьютерной томограмме (КТ). Однако выявлен ряд признаков, свидетельствующих о её возможном развитии в будущем – отягощенная по феохромоцитоме наследственность, преобладание гуморально-метаболической регуляции и сниженная реакция на дыхательную пробу, КТ-признаки нодулярной гиперплазии левого надпочечника, в связи с чем пациент нуждается в наблюдении.

КЛЮЧЕВЫЕ СЛОВА: артериальная гипертензия, феохромоцитома, клинический случай

INTRODUCTION

Patient D. with arterial hypertension (AH), whose mother suffer from pheochromocytoma [1, 2], presented to the Department of Internal Medicine with worrying that his high blood pressure (BP) can be due to the same problem.

He is 37 years old, employee of the security company, in the past - a professional wrestler.

COMPLAINTS

Increased blood pressure, tachycardia episodes and headache of pulsating nature while exercising in the gym.

ANAMNESIS MORBI

Patient started monitoring himself with a home blood pressure monitor at the age of 25 after the diagnosis of his mother with pheochromocytoma. BP readings did not exceed 140/90 mm Hg. Since the age of 30

there were episodes of tachycardia and headaches during training in the gym. BP levels periodically increased up to 160/100 mm Hg, without any accompanying symptoms. In 2014 was examined in National Institute of Therapy named by L. T. Malaya, where the diagnosis was made: Essential Arterial Hypertension, II st., with sympathetic-adrenal paroxysms. «Normatens» 1 tablet at bedtime and carvedilol 12,5 mg 2 times daily under HR control were recommended.

In additional questioning weight loss, episodes of excessive sweating, accompanied by tremors, fever and headache, and symptoms of orthostatic hypotension denied. Episodes of tachycardia and throbbing headache occur only on a background of heavy physical exertion, resolved at rest within 20–30 minutes after exercise discontinuance. BP in these moments has not been measured. Severity of symptoms did not change over the last 7 years. BP measuring is performed occasionally (non-daily) at home, at rest. When elevated blood pressure numbers are registered any other accompanying symptoms are not observed.

Presently episodically takes Normatens (when SBP ≥ 160) and «Koriol» (carvedilol) in case of tachicardia. Last 2 months didn't take any medications.

ANAMNESIS VITAE

Smokes approximately 12 cigarettes per day. Feeds regularly and adequately. Three times a week has training in the gym. Denied drug usage and alcohol intake. Father died of sudden cardiac death at age 54. Mother alive, was diagnosed with pheochromocytoma in 2003, not operated.

STATUS PRESENCE OBJECTIVUS

Condition was satisfactory, consciousness clear, patient was active and not in distress. Type of body constitution was hypersthenic. Height – 168 cm, weight – 78 kg, BMI= 27,6 kg/m2. Skin – normal pink color. Peripheral lymph nodes were not palpable. Thyroid lobes were not palpable; the isthmus was palpated as a homogeneous smooth cross-strand, 1 cm wide. Musculoskeletal system examination was unremarkable. Lungs: resonant percussion note, vesicular breathing over the lungs fields, RR 18 bpm. Heart borders were not extended, heart activity was rhythmic with HR of 72 bpm. Heart tones are clear in all auscultating points. No murmurs. Blood pressure measured in the supine position on the left arm – 145/100 mm Hg, on the right arm – 150/105 mm Hg, PS – 72 bpm. 2 minutes after the transition to the upright position BP on both arms 150/100, HR = 78 bpm. Abdomen was of normal size, painless in palpation. Liver was palpated at the costal margin, painless. There was absence of vascular sounds during abdomen auscultation. Pasternatskiy sign was negative on both sides. No peripheral edema.

PLAN OF SURVEY:

Full blood count, Urinalysis, Basic biochemical panel, ECG, Heart Rate Variability, EchoCG, ABPM, Abdominal ultrasound, CT scanning of the kidney, adrenal glands [3].

RESULTS OF INVESTIGATIONS

The white-cell count was 5.2×10^9/l, with 60 % neutrophils, 33 % lymphocytes, 6 % monocytes and 1 % eosinophils. The hemoglobin level was 156 g per liter, the erythrocytes 5.15×10^{12}/l, and the platelet count 262.7×10^9/l. *Erythrocyte sedimentation rate was 1 mm/h. The urinalysis was normal. The basic biochemical panel and liver-function tests were normal. The total cholesterol was elevated at 6.67 mmol/l (normal range ≤ 5.2 mmol/l), very low-density lipoprotein cholesterol 0.37 mmol/l (normal range up to 0.77 mmol/l), low-density lipoprotein cholesterol was elevated at 4.47 mmol/l (normal range up to 3.1 mmol/l), high-density lipoprotein cholesterol 1.48 mmol/l (normal range 0.9–1.55 mmol/l), triglycerides 0.83 mmol/l (normal range < 1.7 mmol/l), atherogenic ratio was elevated at 3.27 (normal range up to 3.0).*

ECG showed sinus rhythm with HR 70 bpm. Heart axis had horizontal position. A nonspecific ST-T change in left ventricular posterior wall was recorded (Fig. 1).

To assess the state of the autonomic nervous system the breathing test was performed. The level of neuro-humoral regulation at rest was low, with the prevalence of humoral-metabolic regulation. The reaction to the respiratory test was reduced (Krr: 1.20), with a slight strengthening of parasympathetic activity (Fig. 2).

The nature of rhythm regulation at rest (after deep breathing) indicated a stabilization of heart rate with the transition of its regulation from the autonomic nervous system level to a lower

humoral-metabolic level of regulation, which is not able to quickly provide homeostasis (fig. 3).

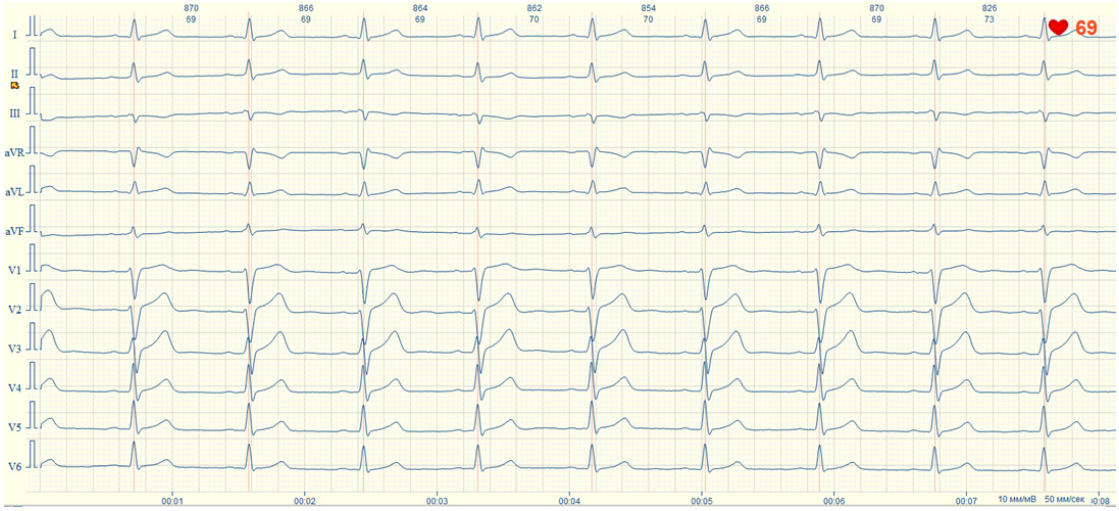

Fig. 1. ECG

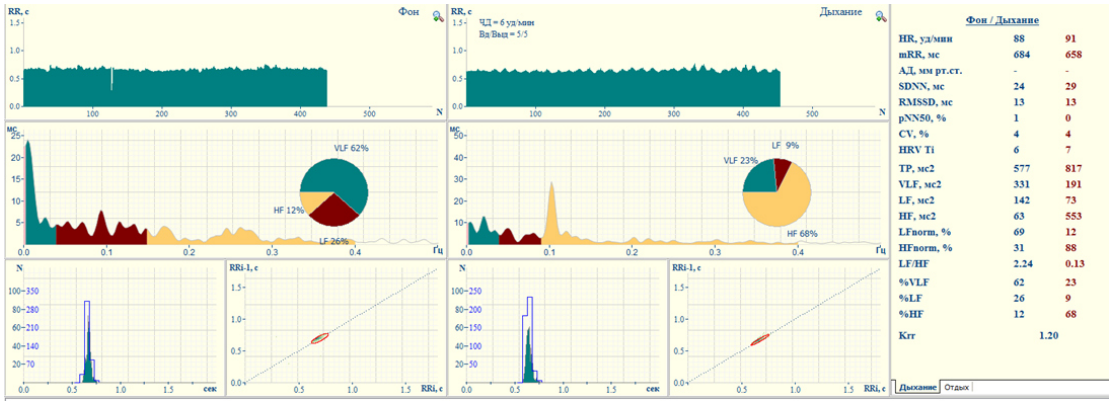

Fig. 2. Breathing test. Base level/breathing

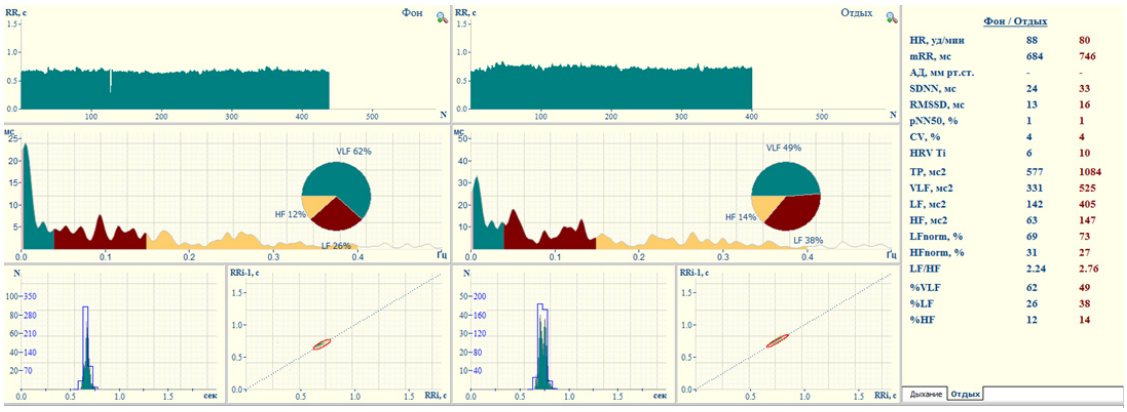

Fig. 3. Breathing test. Breathing / rest

EchoCG showed data indicative of left ventricle (LV) hypertrophy – thickening of the LV posterior wall at 1.56 cm (normal range 0.6-1.2 cm) and intraventricular septum at 1.55 cm (normal range 0.6–1.3 cm) along with increased LV mass at 365.56 g (normal range, men < 183 g) and increased LV mass index at

194.58 g/m^2 (normal range, men < 115 g/m^2 body surface area). Ejection fraction was 60 %.

According to the ABPM data, on the background of the absence of antihypertensive therapy, stable mild systolic 24-h hypertension with a physiological degree of sleep-time relative SBP decline and mild stable awake diastolic hypertension with an excessive fall in DBP at night, with increased variability of SBP and DBP in the 24-h period was recorded. DBP means and variability in SBP and DBP at night in the normal range. The excess MAP sleep-time fall on the background of the normal range during the night and increased - during the day was recorded. Pulse pressure exceeds normal levels during the whole period of monitoring, with a predominance of nocturnal values over the awake ones and the formation of a PAD daily profile of night-peaker type (Tab. 1, 2).

Abdominal ultrasound was unremarkable. Abdominal CT scanning showed adrenal glands, located in a typical place, the right adrenal gland was not enlarged, legs up to 3 mm thick, with clear contours, homogeneous structure. The left adrenal gland was of normal size, with irregularly thickened legs from 3 to 8 mm, with clear contours, homogeneous structure. The surrounding fatty tissue was not changed (Fig. 4, 5). Conclusion: CT-signs of nodular hyperplasia of left adrenal gland.

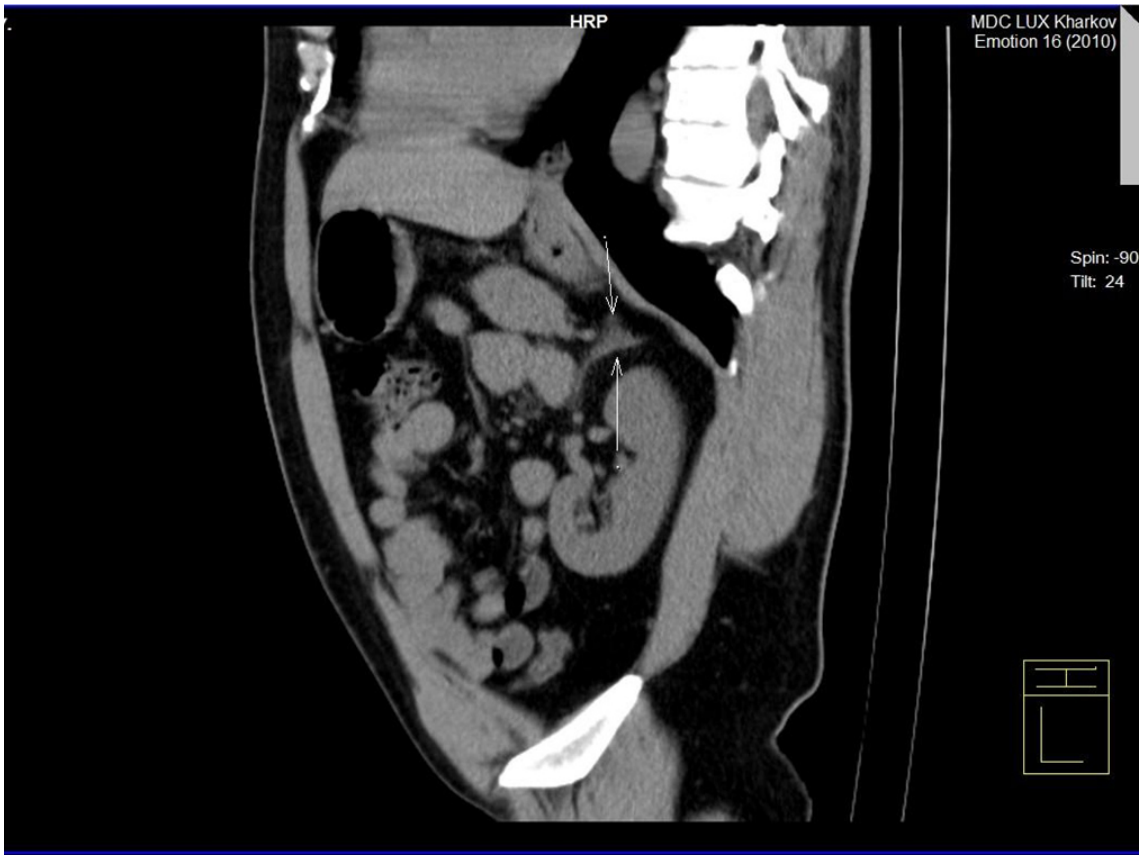

Fig. 4. Left adrenal gland indicated with arrows

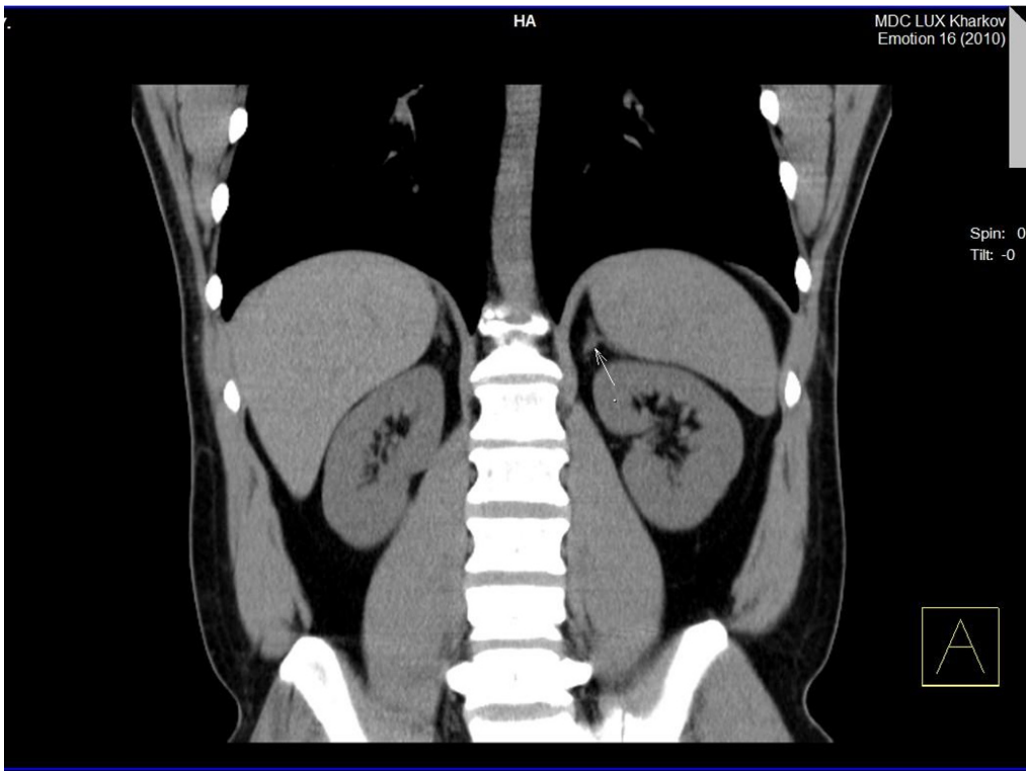

Fig. 5. Left adrenal gland indicated with arrow

Table 1

ABPM means*

Indices	*Patient data*	*Normal Ranges*
24-h PERIOD		
SBP, daily mean, mmHg	142	No more then 130
DBP, daily mean, mmHg	85	No more then 80
MAP, daily mean, mmHg	103	80-95
PAP, daily mean, mmHg	57	Less than 46
SBP time index, %	79.1	Less than 15
DBP time index, %	64.8	Less than 15
SBP variability, mmHg	17.4	No more then 15
DBP variability, mmHg	19.9	No more then 14
MAP variability, mmHg	17.9	*no generally accepted normal values*
PAP variability, mmHg	14.7	*no generally accepted normal values*
AWAKE MEANS		
SBP, awake mean, mmHg	147	No more then 135
DBP, awake mean, mmHg	93	No more then 85
MAP, awake mean, mmHg	110	80-95
PAP, awake mean, mmHg	54	Less than 46
SBP time index, %	84,9	Less than 15
DBP time index, %	81,5	Less than 15
SBP variability, mmHg	16.6	No more then 15
DBP variability, mmHg	17.4	No more then 14
MAP variability, mmHg	14.9	*no generally accepted normal values*
PAP variability, mmHg	16.0	*no generally accepted normal values*
ASLEEP MEANS		
SBP, asleep mean, mmHg	129	No more then 120
DBP, asleep mean, mmHg	65	50-70
MAP, asleep mean, mmHg	84	80-95
PAP, asleep mean, mmHg	64	Less than 46
SBP time index, %	67,7	Less than 15
DBP time index, %	31,9	Less than 15
SBP variability, mmHg	12,0	No more then 15
DBP variability, mmHg	9,6	No more then 14
MAP variability, mmHg	10,0	*no generally accepted normal values*
PAP variability, mmHg	7,4	*no generally accepted normal values*

** SBP – systolic blood pressure, DBP – diastolic blood pressure, MAP – mean arterial pressure, PAP – pulse arterial pressure*

Table 2

Daily BP profiles*

Indices	Profile type	Night-time decline, %
SBP	Dipper	12,5
DBP	Overdipper	29,8
MAP	Overdipper	23,3
PAP	Nightpicker	- 18,5

***** *SBP – systolic blood pressure, DBP – diastolic blood pressure, MAP – mean arterial pressure, PAP – pulse arterial pressure*

The consultation of endocrinologist, measurement of fractionated metanephrines and catecholamines in a 24-hour urine specimen was recommended.

Endocrinologist conclusion: no data for pheochromocytoma. Taking into account data of instrumental methods of investigation, described above, we still recommended to check the level of catecholamines and cortisol in blood and urine.

Motivating with endocrinologist conclusion, the patient refused any further examination.

Taking into account the available data the diagnosis was made:

Arterial hypertension, Grade 2, Stage II (LVH), high risk, with an excessive fall in DBP at night and physiological degree of sleep-time relative SBP decline, with reduced reaction on breathing test, HF 0. Nodular hyperplasia of the left adrenal gland.

The patient was recommended to maintain a healthy lifestyle, smoking cessation, decrease sodium intake, lipid-lowering diet, amlodipine 5 mg in the morning protractedly under the control of blood pressure level.

The patient also was recommended to repeat the ABPM after 3 months, but at the appointed time the patient did not come. In a telephone conversation he said that he feels satisfactory, according to HBPM his BP is within 130–140/85 mm Hg, in further examination and observation he is not interested. It was recommended to continue amlodipine intake, monitoring adrenal hyperplasia using abdominal CT-scanning yearly and measurements adrenal hormones in serum and urine.

CONCLUSIONS

Our patient with AH and family history of pheochromocytoma has no classical clinical signs and imaging phenotype of pheochromocytoma [4], but there are a number of warnings – family history of pheochromocytoma, prevalence of humoral-metabolic regulation and reduced reaction to the respiratory test, CT-signs of nodular hyperplasia of left adrenal gland - which may indicate its possible manifestations in the future, and therefore the monitoring is required.

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