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Adrenocortical oncocytoma — a case report

Guz onkocytarny nadnercza — opis przypadku

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Abstract

Adrenocortical oncocytoma is found very rarely. Most such tumours are benign and nonfunctioning. We report the case of a nonfunctioning adrenocortical oncocytoma located in the right adrenal gland in a 35-year-old man. The patient was tested because of arrhythmia. An adrenal mass of 68 × 64 mm was found during ultrasonography, followed by CT examination. Physical examination indicated obesity with BMI of 32.8 kg/m^2. Abnormal laboratory findings based on an oral glucose tolerance test revealed impaired glucose tolerance and elevated cholesterol level. The patient underwent a laparotomy for a pathological mass located in the right adrenal gland. The pathology report confirmed adrenocortical oncocytoma of uncertain malignant potential. The patient is still alive with no metastases, 37 months after the surgery. Adrenocortical oncocytoma, although extremely rare, should be considered in the differential diagnosis of adrenal tumours. **(Endokrynol Pol 2012; 63 (4): 308–311)**

Key words: *adrenal cortex, adenoma, incidentaloma, adrenal oncocytoma*

Streszczenie

Guz onkocytarny jest rzadko spotykaną zmianą w obrębie nadnerczy. Większość guzów ma charakter łagodny i nie stwierdza się ich aktywności hormonalnej. Przedstawiono przypadek 35-letniego mężczyzny z niewydzielającym guzem onkocytarnym prawego nadnercza. Pacjent wykonywał badania diagnostyczne z powodu zaburzeń rytmu serca. W badaniu ultrasonograficznym, a następnie w CT jamy brzusznej uwidoczniono guz wielkości 68 × 64 mm w obrębie prawego nadnercza. W badaniu przedmiotowym, poza otyłością z BMI 32,8 kg/m^2, nie stwierdzono nieprawidłowości. W badaniach laboratoryjnych zwracały uwagę nieprawidłowa tolerancja glukozy i hipercholesterolemia. Nie wykazano aktywności hormonalnej guza. Pacjenta poddano klasycznej prawostronnej adrenalektomii. W badaniu histopatologicznym dokonano rozpoznania guza onkocytarnego nadnercza o niepewnym potencjale złośliwości. Pacjent pozostaje pod obserwacją od 37 miesięcy, które upłynęły od zabiegu operacyjnego, bez wznowy w miejscu usuniętego guza i zmian przerzutowych. Guz onkocytarny nadnerczy, chociaż wyjątkowo rzadki, należy uwzględniać w diagnostyce różnicowej zmian ogniskowych w nadnerczach. **(Endokrynol Pol 2012; 63 (4): 308–311)**

Słowa kluczowe: *kora nadnerczy, gruczolak, incydentaloma, guz onkocytarny nadnercza*

Introduction

Oncocytoma can occur in various organs. Adrenocortical oncocytoma is found extremely rarely. Most of these tumours are benign and nonfunctioning. This report concerns a large, nonfunctioning tumour of uncertain malignant potential.

Case presentation

A 35-year-old man, with a history of obesity and without a history of hypertension, was examined because of arrhythmia. In August 2007, a 59 × 60 × 61 mm mass, above his right kidney, was accidently found by ultrasonography. Ultrasonography was followed by a CT scan, performed in August 2007. This revealed a 68 × 64 mm adrenal mass. The patient was admitted to hospital to evaluate the adrenal function. On admission, he did not have any symptoms. Physical examination revealed only obesity, with body mass index (BMI) 32.8 kg/m^2. Laboratory tests showed normal serum electrolytes, elevated total and LDL-cholesterol levels, elevated fasting plasma glucose level and abnormal OGGT with 2 h glucose level of 145 mg/dL. Endocrinological tests were performed, showing normal plasma cortisol levels at 8:00 am. Plasma thyroid stimulating hormone (TSH), parathyroid hormone, dehydroepiandrosterone sulphate (DHEA-S) and 24-hour urinary catecholamine excretions were within normal limits (Table I).

Chest X-ray was normal. Thyroid ultrasound and echocardiography were normal. Abdominal computed tomography revealed a 68 × 64 mm polycyclic mass

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Table I. *Laboratory evaluation*
Tabela I. *Wyniki badań*

Parameter	Patient before surgery	Patient 30 months after surgery	Normal ranges
Fasting plasma glucose [mg/dL]	98 113	93 100	60–99
OGTT 2-h [mg/dL]	145	114	–
Plasma, basal cortisol [ug/dL]	16.8	12.8	6.2–19.4
Plasma, late night cortisol [ug/dL]	1.8	1.4	–
Thyroid-stimulating hormone [uIU/mL]	1.03	1.50	0.27–4.2
DHEA-S [ug/dL]	206.0	307.6	88.9–427
24-h urine collection for metanephrines [ug/24-hour]	437.0 236.0	–	< 1.000
Androstendion [ng/mL]	–	1.21	0.6–3.1

with mixed density in the right adrenal gland. Precontrast phase revealed mean density of 42 HU (–17 +98 HU); arterial phase mean density of 70 HU (+13 +126 HU); portal phase mean density of 63 HU (+7 +118 HU), and delayed scan mean density of 52 HU (–4 +108 HU). The right adrenal mass was modelling the inferior caval vein and splanchnic surface of the right liver lobe. The right kidney was displaced downward. There were no signs of infiltration in surrounding adipose tissue or perirenal fascia (Figure 1).

The patient underwent surgery for right adrenalectomy in January 2008. The tumour measured 8 × 7 × 6 cm.

Pathologic findings

Gross examination revealed a well circumscribed, solid tumour, which measured 8 × 7 × 6 cm. On the periphery of the tumour, residual adrenal tissue was seen focally. The cut surface was brown-greyish. There were no cystic degenerations, haemorrhages or necrosis.

Microscopically, the tumour was composed of moderate to large polygonal cells with abundant, eosinophilic and granular cytoplasm (representing oncocytic features), predominantly arranged in a diffuse or solid pattern (Figure 2). The nuclei were round or oval with a single, large and prominent nucleolus. Bizarre, highly pleomorphic nuclei (nuclear atypia) and nuclear pseudoinclusions were also seen focally (Figure 3). Inflammatory cells (mainly lymphocytes) were present in stroma of the tumour. There was no evidence of necrosis, capsular, vascular or sinusoidal invasion. Mitotic figures were identified, numbering 1 per 50 high power fields. No atypical mitotic figures were found. The proliferative index Ki67 was 0%. Immunohistochemical examination revealed positivity for melan-A; whereas chromogranin, cytokeratins AE1/AE3, EMA and vimentin were negative. On the

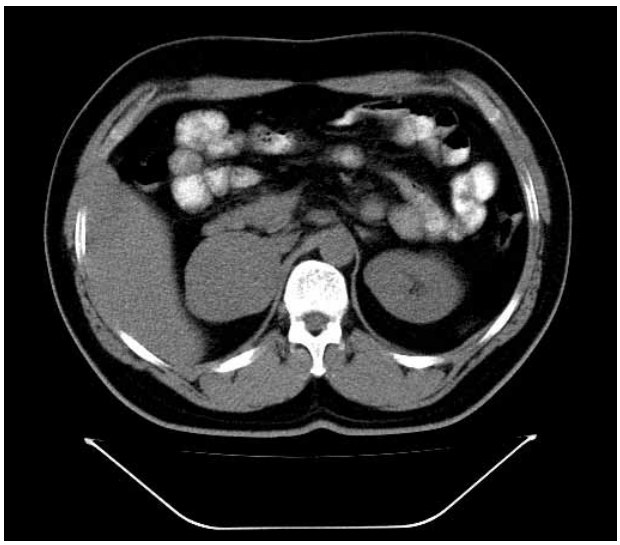

Figure 1. *Abdominal CT showing tumour in the right adrenal gland area*
Rycina 1. *CT jamy brzusznej uwidaczniające guz okolicy prawego nadnercza*

basis of these findings, and because of the lack of any histological features of malignancy, the final diagnosis of an adrenocortical oncocytoma (according to the WHO classification of adrenal cortical adenoma- oncocytoma) was made. However, clinical observation was suggested because of the still uncertain and dubious histologic criteria to categorically differentiate benign from malignant adrenocortical oncocytic tumour.

Abdomen ultrasonography was performed three and 14 months after surgery without any pathological findings; 30 months after surgery, during physical examination of the patient, we found BMI of 31.2 kg/m^2 without any other abnormalities. The control abdomen CT scan did not reveal any abnormal findings in the right adrenal area. A new focus of a 9 mm in diameter

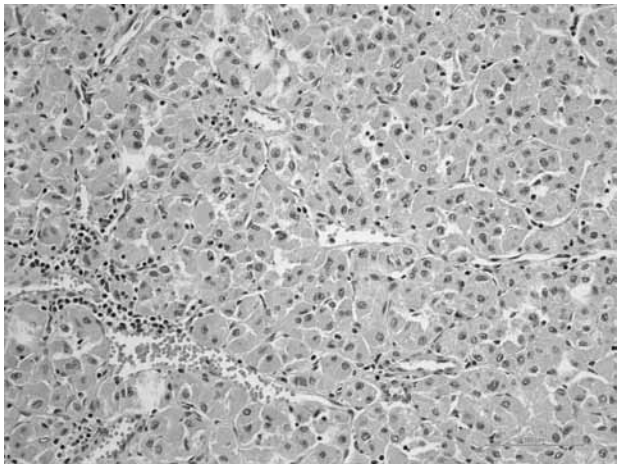

Figure 2. *Adrenal tumour composed of moderate to large polygonal cells with abundant, eosinophilic and granular cytoplasm (representing oncocytic features), predominantly arranged in a diffuse or solid pattern. HE, objective ×20*

Rycina 2. *Guz nadnercza zbudowany z dużych, wielobocznych komórek o obfitej, ziarnistej, kwasochłonnej cytoplazmie (komórek oksyfilnych) tworzących lite, rozlane układy. HE, obiektyw ×20*

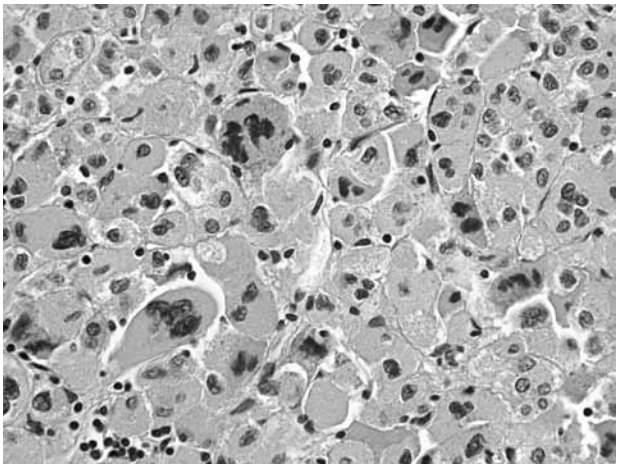

Figure 3. *Adrenal tumour — the nuclei were round or oval with a single, large and prominent nucleolus. The bizarre, highly pleomorphic nuclei (nuclear atypia) and nuclear pseudoinclusions were also seen focally. HE, objective ×40*

Rycina 3. *Guz nadnercza — okrągłe lub owalne jądra komórkowe zawierające pojedyncze, duże, wyraźne jąderko. Ogniskowo widoczne komórki z cechami nasilonego pleomorfizmu jądrowego oraz zawierające pseudoinkluzje wewnątrzjądrowe. HE, obiektyw ×40*

hepatic hemangioma was found. Control laboratory results were within normal limits (serum electrolytes, lipids, diurnal variation of plasma cortisol, DHEA-S, androstendion and TSH). Fasting plasma glucose was borderline — 100 mg/dL, with normal glucose levels in 2-h of OGTT (Table I). The patient is still alive, 37 months after surgery. The abdomen ultrasonography did not reveal any abnormalities.

Discussion

An adrenal incidentaloma is an adrenal mass, ≥ 1cm in diameter, that is discovered during a radiologic examination performed for indications other than an evaluation for adrenal disease [1]. The widespread use of abdominal ultrasonogrphy, computed tomography and magnetic resonance imaging have resulted in a frequent clinical problem of having to evaluate the potential malignancy or hormonal activity of an adrenal mass. The frequency of adrenal incidentalomas is age-dependent, with the highest occurrence among patients over 60 years old. The evaluation of an adrenal mass includes hormonal activity and radiologic characteristics of the tumour, as well as a history of previous malignant lesions [2]. The majority of adrenal incidentalomas are benign adrenocortical adenomas. Most of them are not hypersecreting. Other reported tumours include hypersecreting adrenocortical adenomas, pheochromocytoma, adrenocortical carcinoma, lymphoma, myelolipoma, metastatic carcinoma and oncocytoma [1, 2]. Oncocytomas are tumours in which all or almost all of the cells are oncocytic. Ultrastructural study reveals oncocytes containing numerous mitochondria. Neoplasms, composed predominantly of oncocytes, are well defined in the kidney, thyroid and salivary glands [3]. There have been reports of very rare oncotytic tumours in the pituitary gland, parathyroid glands, lacrimal glands, and spinal cord [3–5]. An adrenocortical localisation of oncocytoma is diagnosed also very rarely. These tumours are mostly nonfunctioning and benign, but malignant ones with invasion and metastases have also been described [6, 7]. The tumours are detected mainly incidentally during investigation of unrelated symptoms [8]. In our case, the tumour was also found incidentally. The patient was examined due to a complaint of palpitations. CT scan, following the ultrasonography, revealed a 68 × 64 mm adrenal mass.

The size of the mass and imaging phenothype are the two major predictors of malignant disease. The latest guidelines for the management of adrenal incidentalomas, published in 2009, recommend adrenalectomy after hormonal evaluation in patients with a tumour of ≥ 4 cm in diameter [2], although the patient's age as well as coexisting conditions should be taken into account. Characteristic features, obtained during the CT and used to distinguish adenomas from potentially malignant tumours, are as follows: lipid content of the adrenal mass and rapidity of the washout of contrast medium [1]. The adenomas contain the intracytoplasmatic fat resulting in low attenuation on unenhanced CT. In-phase and out-of-phase MRI can also identify the lipid content of the adrenal tumour. Benign adreno-

cortical adenomas lose signal on out-of-phase images, compared to in-phase images [9]. However, there are also adenomas which do not contain a large amount of lipids and it is impossible to distinguish adenomas from nonadenomas using both CT and MRI. The CT features in our patient revealed high precontrast phase mean density of 42 HU, without rapid washout, suggesting nonadenoma in the right adrenal gland. The suspicious phenotype and diameter of the tumour in a young man led us decide to perform a right adrenaletomy. The hormonal assessment preceded the surgery. A nonfunctioning tumour was found in our patient.

The biological behaviour of adrenal tumours should be evaluated using their combined clinical, biochemical and histological features. There is no single histological parameter that is predictive of the clinical outcome and biologic behaviour of adrenocortical oncocytic neoplasms. The Weiss system is the most widely used histological scheme to distinguish benign from malignant adrenal tumours [10, 11]. The pathological examination of this tumour was based on the Weiss scale, in which nuclear grade atypia, the mitotic rate, atypical mitoses, the character of cytoplasm, the architecture of the tumour, necrosis, veins, sinusoids and tumour capsule infiltration were considered. The presence of at least four of these nine critera is indicative of malignancy. Mitotic activity was counted in 50 randomly selected fields in the areas of the highest number of mitotic figures under 400 × magnification (HPF, high power fields). Bisceglia et al. proposed Weiss modified criteria indicating malignant or benign lesions and tumours of uncertain malignant potential [12]. If the tumour presents any of the major criteria (high mitotic activity, atypical mitoses or venous invasion), it is considered malignant; if the tumour presents any of the minor criteria (large size, necrosis, capsular or sinusoidal invasion) it is considered to have uncertain malignant potential; and none of these features indicates a benign tumour [12].

Our patient was diagnosed as having an oncocytic neoplasm, with uncertain malignant potential. The patient underwent clinical observation with repeated ultrasound and CT examination, finding no recurrence or metastases within 37 months after the surgery. The patient will continue to be followed up, as previously, every six months.

Conclusions

Adrenocortical oncocytoma, although extremely rare, should be considered as a possible diagnosis in adrenal tumours.

Declaration of interest

The authors have nothing to declare.

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