



Two cases of pheochromocytoma in pregnancy: a multidisciplinary challenge

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Introduction

Pheochromocytomas are rare, mostly benign tumours arising from chromaffin cells of the adrenal medulla or many extra-adrenal locations (where they are called paragangliomas). They constitute 7% (1.5–14%) of all adrenal incidentalomas [1] and are extremely rare in pregnant women, with a prevalence of 1 in 54,000 pregnancies [2]. The diagnosis is a demanding challenge because the clinical picture ranges from asymptomatic cases to life-threatening hypertensive crises. The disease poses a serious risk to both the mother and the foetus, with a mortality rate of 40–50% in untreated cases [3]. Therefore, developing a systematic, individualised approach by a multidisciplinary team is crucial for the management of the disease and its consequences.

In this paper, we describe two cases of pheochromocytoma in pregnant women and provide insight into

possible dissimilarities in diagnosis, management, and treatment of the disease.

Case no. 1

A 29-year-old pregnant woman at nine weeks of menstrual age, with recently diagnosed multiple endocrine neoplasia type 2A (MEN2A) syndrome presented herself to the endocrinology outpatient clinic with no symptoms. Blood pressure was 130/80 mm Hg with regular heart rate of 80 bpm. Ultrasound revealed multiple hypoechoogenic thyroid nodules and right adrenal hypoechoogenic mass (15 mm in diameter). During further diagnostics in the Endocrinology Department, the patient remained asymptomatic and normotensive. Urinary catecholamine metabolites were elevated (Tab. I). Magnetic resonance imaging (MRI) revealed lesions in both adrenal glands (Fig. 1A). Moreover,

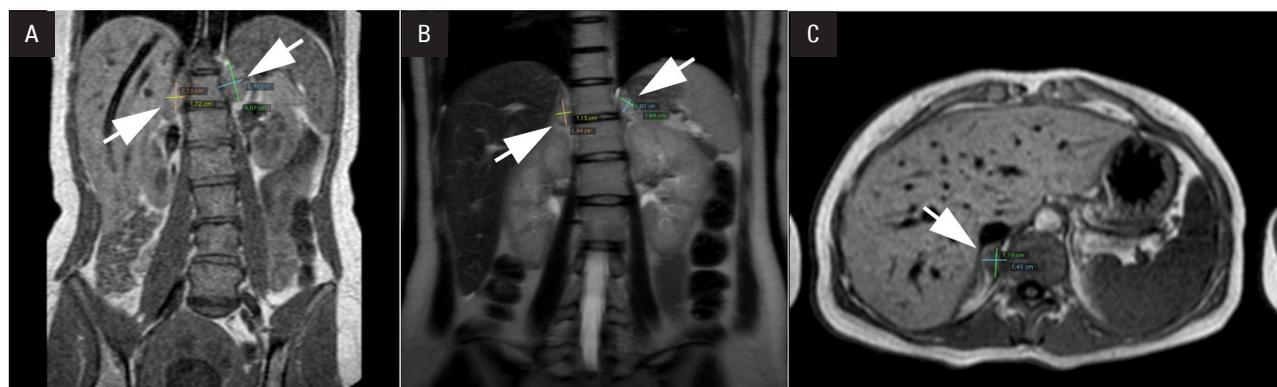


Figure 1. Magnetic resonance imaging of the abdomen without gadolinium. **A.** Case no. 1: A 40 × 24 mm heterogenous mass in the left adrenal gland and a 25 × 17 mm, mostly homogenous mass in the right adrenal gland; **B.** Case no. 2.: A 18 × 12 mm lesion with moderately high signal intensity in T2-weighted imaging in the right adrenal gland. In the left adrenal gland, a 17 × 11 mm mass is present, with similarly increased T2 signal. **C.** Case no. 2. A 18 × 15 mm mass in the right adrenal gland



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Table 1. Urinary catecholamine metabolites in two cases of pregnant women before and after adrenalectomy

	Normal value	Case no. 1		Case no. 2	
		Before	After	Before	After
NMN [$\mu\text{g}/24\text{ h}$]	88–440	1137.6	178.1	583.2	325.1
MN [$\mu\text{g}/24\text{ h}$]	52–341	1654.6	Undetectable	564.7	305.7
3-MT [$\mu\text{g}/24\text{ h}$]	0–220	163.2	59.9	144.9	148.9

NMN — normetanephrine; MN — metanephrine; 3-MT— 3-methoxytyramine

fine needle biopsy of thyroid nodules was performed, with a histological image corresponding to medullary cancer. The patient did not consent to any surgical procedure during pregnancy, so adrenalectomy and thyroidectomy were postponed until after delivery. Conservative treatment with α - and β -blockers (doxazosin, propranolol) was started. Due to risk of preterm delivery, caesarean section was performed in the 33rd week of pregnancy. Preoperatively, a high risk of hypertensive crisis was recognised, but eventually her blood pressure of 170/100 was lowered and stabilised with alpha-blockers and β -blockers. The rest of the delivery was uneventful. Six weeks later, the patient underwent successful laparoscopic bilateral adrenalectomy. In the pathology report, bilateral pheochromocytomas were confirmed. Six weeks after that, total thyroidectomy was performed. During follow-up, urinary catecholamine metabolites (Tab. 1) and blood pressure were normal. Recovery was satisfactory, the patient remains under regular surveillance in our Department due to MEN2A syndrome.

Case no. 2

A 29-year-old woman with history of MEN 2A syndrome, medullary thyroid cancer, and primary hyperparathyroidism. Elevated urinary catecholamine metabolites were discovered during a routine follow-up (Tab. I). The patient reported “paroxysmal fatigue”. On examination, blood pressure was 105/70 mm Hg and heart rate was regular at 68 bpm. MRI was performed, revealing two lesions in the right adrenal gland and one in the left adrenal gland (Fig. 1B and 1C). Combined results were suggestive of bilateral pheochromocytomas. Adrenalectomy was planned, but due to the discovery of early pregnancy (10th week), the procedure was postponed until the second trimester. Conservative treatment with doxazosin was initiated. In the 21st week of pregnancy, a right-side open adrenalectomy was performed. Perioperatively, doxazosin was used to prevent blood pressure spikes. The decision was made

to keep the left adrenal gland under observation. In the pathology report, two pheochromocytomas were identified. The rest of the pregnancy and the delivery were uneventful. During follow-up, no significant rises in urinary catecholamine metabolites (Tab. 1) or blood pressure were observed. After that, the patient stopped reporting to our department.

Discussion

Pheochromocytoma in pregnancy is a rare and complex condition. Sustained hypertension or hypertensive crises are dangerous to the mother; moreover, vasoconstriction in the uteroplacental circulation caused by excess catecholamines can lead to intrauterine hypoxia and placental abruption [4]. Despite the rarity of such a diagnosis, physicians should be aware of pheochromocytoma as one of the possible causes of gestational hypertension [5]. As our cases prove, caution should be taken when examining even the asymptomatic patients with germline mutations associated with this tumour. Hereditary pheochromocytoma constitutes around 30% of all cases [3].

Surgery is the treatment of choice, with the laparoscopic approach being the preferred one nowadays [4]. The second trimester is considered to be optimal because the organogenesis of the foetus is already complete and the pregnant uterus does not block the view as much as it would in the third trimester [3]. Conservative and perioperative treatments consist of an α -blocker and an optional β -blocker [3,4].

No standardised guidelines for treatment of pheochromocytoma in pregnancy have been established, which forces clinicians to rely on their own experience. Early diagnosis and appropriate treatment, with correctly timed surgery being the method of choice, are the keys to keeping both the mother and the foetus safe.

Conflict of interest

None declared.

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