

Pseudopheochromocytoma following Adrenal Hemorrhage

¹Geraint J Rees, ²J Stephen Davies, ¹David M Scott-Coombes

¹Departments of Endocrine Surgery, University Hospital of Wales, Heath Park, Cardiff CF14 4XW, United Kingdom

²Department of Endocrinology, Metabolism and Diabetes, University Hospital of Wales, Heath Park, Cardiff CF14 4XW, United Kingdom

Correspondence: David M Scott-Coombes, Departments of Endocrine Surgery, University Hospital of Wales, Heath Park Cardiff CF14 4XW, United Kingdom, Phone: (+44) 2920743349, Fax: (+44) 2920744553, e-mail: David.Scott-Coombes@wales.nhs.uk

Abstract

Pseudopheochromocytoma usually presents with the signs and symptoms suggestive of pheochromocytoma, yet investigations fail to show any evidence of the tumor. This case reports a man who presented with severe abdominal pain and hypertension without previous symptoms of anxiety, tremor or palpitations at the time of presentation. Initial 24 hours urinary metanephrines were raised which suggested a diagnosis of hemorrhage into a pheochromocytoma. Clinicians need to be aware of this scenario if unnecessary surgery is to be avoided.

Keywords: Pheochromocytoma, pseudopheochromocytoma, adrenalectomy.

INTRODUCTION

Pheochromocytomas are rare catecholamine producing endocrine tumors with a prevalence of between 0.1 to 0.6% of patients with hypertension.¹ Around 80 to 85% arise from chromaffin cells of the adrenal medulla whilst the other 15 to 20% are extra-adrenal and usually arise within the abdomen and are also known as paragangliomas.¹ Pseudopheochromocytoma usually presents with the signs and symptoms suggestive of pheochromocytoma, yet investigations fail to show any evidence of the tumor. Symptoms tend to be paroxysmal and include episodes of headaches, sweating, palpitations and hypertension, but can lead to serious possibly life-threatening cardiac complications if they are left untreated.

The conventional means of detecting pheochromocytomas is by identifying elevations of urinary or plasma catecholamines, urinary metanephrine and normetanephrine.² Urinary metanephrines have been shown to have a sensitivity of 97% for sporadic pheochromocytomas and total urinary metanephrines have been shown to have a specificity of 97% for hereditary pheochromocytomas.³ False positives however, have been well-documented with patients on certain medications (e.g. β -blockers, tricyclic antidepressants), diets, as well as other medical conditions (e.g. heart failure).¹

Once a biochemical diagnosis is established a CT scan of the abdomen and pelvis is most often done for localization of the tumor, and after a period of pharmacological stabilization the patient is usually treated by laparoscopic excision of the tumor.

CASE REPORT

A 56 years old man was admitted with sudden onset left sided abdominal pain and hypertension. There was no recent history of trauma, although he had fallen a few months earlier injuring his back. He had a background medical history of asthma but was not taking any medication and was otherwise well. At the time he gave no history of headaches, palpitations, sweating or other symptoms suggestive of pheochromocytoma.

His blood pressure on admission was 205/101 mm Hg, and clinical examination revealed guarding and rebound tenderness on the left side of his abdomen from the left hypochondrium to the left iliac fossa. His blood tests showed a neutrophilia (WCC 22.0×10^{10} , neutrophils 20.2×10^{10}) with the rest of his blood tests being within the normal range. His hemoglobin on admission was 13.4 gm/dl, however this dropped by the following day to 8.2 gm/dl. A CT scan of his abdomen showed a 14 cm \times 14 cm \times 12 cm left suprarenal mass highly suggestive of an acute hemorrhage into a likely adrenal myelolipoma (Figs 1 and 2).



Fig. 1: Coronal CT of the abdomen showing left suprarenal mass with hemorrhage at the periphery

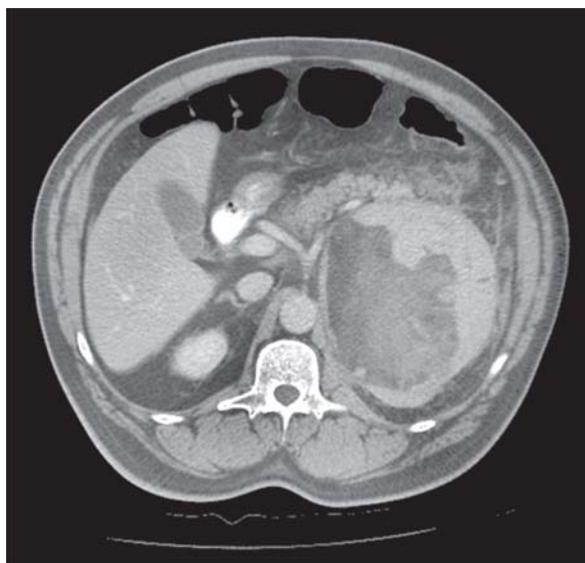


Fig. 2: Axial CT of abdomen showing the left adrenal mass and peripheral hemorrhage

Acutely, this gentleman required management in a HDU setting and he was transfused four units of blood. During the first few days of his admission his blood pressure remained high (241/118 mm Hg on day 3), and given the history of adrenal mass (Albeit likely myelolipoma) he was diagnosed as having a pheochromocytoma and was treated with phenoxybenzamine and propranolol. Confirmation of this diagnosis was thought to have been made with elevated 24 hours urinary metanephrine of 7.26 $\mu\text{mol}/24$ hrs (Normal range 0-4.0 $\mu\text{mol}/24$ hrs). He was therefore referred to the endocrine surgeons for consideration for excision of his suprarenal mass.

However, following review by both endocrinologists and endocrine surgeons, and given his CT report, it was felt that this gentleman's symptoms might in fact represent a 'pseudopheochromocytoma'. Surgical intervention was therefore delayed and his urinary metanephrines were repeated one month after his initial presentation. At follow-up these tests, as well as his blood pressure were found to have returned to the normal range, and therefore his phenoxybenzamine and propranolol were stopped. He is awaiting a follow-up CT scan.

DISCUSSION

Cases of pseudopheochromocytomas are rare but have been reported since 1956.⁴ Mackenzie et al described it as a rare but often disabling syndrome of paroxysmal severe hypertension and symptoms of catecholamine excess, including feelings of anxiety, tremor, sweating and palpitations, and suggested it was a diagnosis of exclusion. They described the main difference of pseudo from true pheochromocytoma to be 'no definite anatomical or biochemical abnormality, although evidence of mild-to-moderate catecholamine excess may be present, particularly during paroxysms'.⁵ Case reports of this condition have been linked to obstructive sleep apnea, Parkinson's disease as well as different medications.⁶⁻⁸ One paper reports five patients with adrenal cortical tumors and biochemical evidence of pheochromocytoma, treated surgically but subsequent histology ruling out this diagnosis.⁹

Adrenal myelolipomas are rare, hormonally inactive, benign neoplasms composed of mature adipose and hematopoietic tissues.¹⁰ Adrenal masses that are > 6 cm are generally treated surgically, as approximately 25% of these are adrenal cortical carcinomas. However, lesions such as myelolipomas, that are hormonally inactive and appear benign on imaging do not require surgery and can be monitored.^{11,12} Therefore in this particular case the patient has not undergone surgery, but he is due for repeat CT scan and follow-up at 3 months.

CONCLUSION

This case reports a man who presented with severe abdominal pain and hypertension without previous symptoms of anxiety, tremor or palpitations at the time of presentation. Initial 24 hours urinary metanephrines were raised which suggested a diagnosis of hemorrhage into a pheochromocytoma. However, a CT scan suggested that the mass was an adrenal myelolipoma and repeat urinary tests as well as his blood pressure had returned to normal on

follow-up. This case illustrates the rarely reported event of adrenal hemorrhage mimicking a pheochromocytoma. Clinicians need to be aware of this scenario if unnecessary surgery is to be avoided.

REFERENCES

1. Lenders JW, et al. Pheochromocytoma. *Lancet* 2005; 366(9486):665-75.
2. Boyle JG, et al. Comparison of diagnostic accuracy of urinary free metanephrines, vanillyl mandelic acid, and catecholamines and plasma catecholamines for diagnosis of pheochromocytoma. *J Clin Endocrinol Metab* 2007;92(12):4602-08.
3. Lenders JW, et al. Biochemical diagnosis of pheochromocytoma: Which test is best? *JAMA* 2002;287(11):1427-34.
4. Ley H, A Ploeger. The concept of pseudopheochromocytoma. *Munch Med Wochenschr* 1956;98(15):531-34.
5. Mackenzie IS, Brown MJ. Pseudopheochromocytoma. *J Hypertens* 2007;25(11):2204-06.
6. Cheezum MK, Lettieri CJ. Obstructive sleep apnea presenting as pseudopheochromocytoma. *J Clin Sleep Med* 2010;6(2): 190-01.
7. Duarte J, et al. Pseudopheochromocytoma in a patient with Parkinson's disease. *Ann Pharmacother* 1996;30(5):546.
8. Krentz AJ, et al. Drug Points: Pseudophaeochromocytoma syndrome associated with clozapine. *BMJ* 2001;322(7296): 1213.
9. Alsabeh R, et al. Adrenal cortical tumors clinically mimicking pheochromocytoma. *Am J Clin Pathol* 1995;104(4):382-90.
10. Han M, et al. The natural history and treatment of adrenal myelolipoma. *J Urol* 1997;157(4):1213-16.
11. Grumbach MM, et al. Management of the clinically inapparent adrenal mass (incidentaloma). *Ann Intern Med* 2003;138(5): 424-29.
12. Llinos DA van-Heerden J. *Adrenal Glands. Diagnostic Aspects and Surgical Therapy*, Berlin: Springer 2005.