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CASE REPORT OPEN ACCESS

Pheochromocytoma presenting with abdominal pain and predominant norepinephrine secretion in a young adult Nigerian: A case report

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Abstract
Background: Pheochromocytoma is a rare neuroendocrine tumour of adrenal chromaffin cells, accounting for a tiny proportion of hypertension cases and adrenal masses. The neoplasm is commoner in the fourth and fifth decades of life but can uncommonly occur in younger people. In sporadic cases, abdominal pain can be an infrequent clinical presentation. With variable quantities of norepinephrine, pheochromocytoma primarily secretes epinephrine.
Case Presentation: A 25-year-old male with left flank pain, hypertension, and weight loss presented to our endocrinology outpatient clinic. Physical examinations revealed tachycardia, hypertension, and tenderness in the left flank. Urinalysis revealed glucosuria, proteinuria, ketonuria, and haematuria. Urinary and plasma catecholamines were markedly elevated (predominantly norepinephrine). An abdominal ultrasound revealed a mass in the left upper quadrant, with no metastasis or invasion. Post-admission, he struggled with poor glycaemic and blood pressure control. He was placed on basal bolus insulin therapy and antihypertensives. He underwent an exploratory laparotomy and left adrenalectomy, and has been in remission.
Conclusion: Persistent or resistant hypertension in a young adult accompanied by abdominal pain and hyperglycaemia should prompt consideration of pheochromocytoma, as recognising this pattern is crucial for timely biochemical testing and definitive diagnosis.

Keywords: Pheochromocytoma, abdominal pain, predominant norepinephrine secretion, young adult, Nigerian

Introduction

Pheochromocytoma (PCC) is a rare catecholamine-producing neuroendocrine tumour derived from chromaffin cells of the adrenals. It accounts for less than 0.2% of the total aetiologies of hypertension (1). About 65% of all cases of pheochromocytoma arise from the adrenal glands and 15% from extra-adrenal chromaffin cells called paraganglioma (2). Additionally, it accounts for 5% of all adrenal

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masses. Over the decades, the incidence of pheochromocytoma has increased from 0.19/100,000 per annum before 2000 to 0.58/100,000 per annum after 2010 (1). Although pheochromocytomas are rare, malignant cases are even more uncommon, with an incidence of approximately 0.5 to 2.0 new cases per million people annually (3). Approximately 5% to 7% of patients with adrenal incidentalomas are diagnosed with PCCs. Sporadic pheochromocytomas can occur at any age; they are more common between the third and fifth decades, with an equal incidence in males and females (4).

Although rare, the clinical presentation is highly variable, making early recognition challenging, particularly in low-resource settings. Symptoms include hypertension, headaches, palpitations, excessive sweating, nausea, weight loss, and anxiety. Classically, a minute percentage is present with a triad of headaches, palpitations, and excessive sweating. Pheochromocytoma is diagnosed by clinical symptoms, elevated catecholamines in blood and urine, and radiological evidence of an adrenal tumour (4). Surgery remains the mainstay of treatment; however, preoperative management of alpha and beta receptor blockade is essential in preventing sinister cardiovascular complications during surgery (4, 5, 6). We are presenting a 25-year-old Nigerian man diagnosed with pheochromocytoma who presented with resistant hypertension, abdominal pain, and weight loss.

Case summary

A 25-year-old male presented to our endocrinology outpatient clinic with left flank pain, hypertension, and weight loss of 10 months' duration. Physical examinations revealed a tachycardia (112 beats per minute) and hypertension (164/90mmHg); he had marked non-radiating tenderness in the left flank on abdominal examination. Other aspects of physical examination were not remarkable. Urinalysis revealed glucosuria, proteinuria, ketonuria, and haematuria. Renal and liver function tests were normal. Glycated haemoglobin and oral glucose tolerance tests were markedly elevated, necessitating the inpatient admission to control blood pressure and blood glucose. Abdominopelvic ultrasound revealed a 7.4 by 6.5 cm mass in the left upper quadrant with inconclusive delineation of the tumour origin. Abdominopelvic CT scan showed a left suprarenal mass with 10-65 HU compressing the ipsilateral kidney, measuring 76mm by 71mm by 57 mm with no radiological features of metastasis or invasion of adjacent structures. Urinary and plasma catecholamines were markedly elevated (see Table 1), and an assessment of pheochromocytoma was made.

Table 1: Laboratory Results

Investigation	Result	Reference interval
Serum Dopamine Level	<50	0-55 ng/L
Plasma Metanephrine	19.24	<90 pg/mL
Plasma Norepinephrine	2145	0-500ng/L
Plasma Epinephrine	<50	0-90ng/mL
Liver Function Test		
ALT	31	<40umol/L
AST	42	<40umol/L
ALP	486	<256umol/L
GGT	162	7-50umol/L
Total Bilirubin	8.7	1.7-17umol/L
Conjugated Bilirubin	4.4	0- 6.8umol/L
Total Protein	8.3	6-8 g/dL
Albumin	4.5	4.5 3.5-5.2g/dL
Urinalysis		
Protein	1+	
Glucose	2+	
Ketones	1+	
Blood	-	
PH	1.005	
Nitrite	-	
Urobilinogen	-	
Leucocyte	-	
Oral Glucose Tolerance Test		
HbA1c	13.4	<6.5%
OGTT 0 hour	24.7	<5.6mmol/L
OGTT 2 hours	34	< 7.8 mmol/L

His clinical course post-admission was significant for poor glycaemic and blood pressure control. He failed oral antidiabetic agents, namely Metformin, Vidagliptin, and Glimeperide, at their ceiling doses. He was subsequently placed on basal bolus insulin therapy with subcutaneous Lantus and Asparte, respectively (each at 24IU) to achieve glycaemic control. Antihypertensives included a cocktail of tablet prazocin 0.125mg q.d., tablet phenoxybenzamine 10mg q12h, and tablet Labetalol 200mg q12h, which helped with blood pressure control. He later had an exploratory laparotomy and left adrenalectomy 1 month after admission and has been in remission. Patient has had several clinic visits and has been symptom-free.

Discussion

Pheochromocytomas are neuroendocrine catecholamine-secreting tumours of the adrenal medulla, and Paragangliomas are of extra-adrenal origins. They are mostly asymptomatic; classically, they present with spells consistent with episodes of sympathetic overactivity, characterised by palpitations, excessive sweating, hypertension, and headaches (7). Although uncommon, pheochromocytoma can occasionally cause bradycardia due to autonomic instability, conduction system abnormalities, or heightened vagal activity triggered by catecholamine surges (4). Our patient presented with the classic constellation of symptoms characteristic of pheochromocytoma and abdominal pain, which is a rare presentation of the disease (8).

Although pheochromocytoma typically manifests with episodic headache, sweating, and tachycardia, rarely some patients may present with acute abdominal pain as a prominent feature. This pain is often attributed to the mass effect of the tumour on adjacent organs, such as the liver, or to haemorrhagic necrosis and spontaneous rupture of the tumour (8).

Elevated liver transaminases have also been reported in association with pheochromocytoma, reflecting hepatic involvement. The proposed mechanism involves excessive catecholamine secretion, which increases vascular resistance in hepatic arterioles and veins, thereby reducing hepatic blood flow and oxygen delivery, ultimately leading to impaired liver function and raised enzyme levels (8). In our patient, abdominal pain and mild transaminitis likely reflected catecholamine-induced hepatic ischemia.

Pheochromocytoma is uncommon, occurring in less than 0.2% of all hypertensive patients. It is common in the fourth and fifth decades, with equal distributions in both males and females. Pheochromocytoma can be sporadic or familial; the familial type presents earlier as genetic syndromes, for example, neurofibromatosis type 1, multiple endocrine neoplasia type 2, and Von Hippel-Lindau disease (7). It is worthy of note that our patient has no family history of the aforementioned syndromes and presented with pheochromocytoma at the age of 25.

Commonly, pheochromocytoma predominantly secretes epinephrine with varying amounts of norepinephrine, while paragangliomas mainly produce norepinephrine and dopamine (7). However, our patient's result revealed that the predominant catecholamine was norepinephrine, with infinitesimal levels of epinephrine and dopamine. Norepinephrine-predominant tumours have important clinical significance because their continuous secretion of norepinephrine causes sustained vasoconstriction, leading to persistent hypertension and an increased risk of cardiovascular complications such as left ventricular hypertrophy and stroke. In contrast, epinephrine-predominant tumours often produce paroxysmal symptoms such as palpitations, tachycardia, and episodic hypertension due to transient surges of epinephrine and its beta-adrenergic effects (9).

While a history, physical examination, and biochemical tests are sufficient to make a diagnosis of phaeochromocytoma, radiological imaging serves as a good adjunct to localise the disease, determine the size of the tumour, and also rule out metastasis (10). Our patient's abdominopelvic ultrasound showed a tumour in the left upper quadrant, while the abdominal computed tomography revealed a left suprarenal mass without features of metastasis.

The hallmark of treating pheochromocytoma is surgical resection, which is preceded by stringent haemodynamic control with alpha-adrenergic blockade followed by beta-adrenergic blockade. Our patient had alpha- and beta-adrenergic blockade and a surgical resection of the tumour and has been symptom-free ever since.

Conclusion

Pheochromocytoma is an uncommon cause of hypertension. Clinicians should maintain a high index of suspicion in young adults presenting with poorly controlled hypertension, abdominal pain, and hyperglycaemia. Recognising this clinical pattern should prompt biochemical testing for catecholamine excess and appropriate imaging studies to confirm the diagnosis. Early identification is essential, as timely surgical resection following adequate preoperative medical optimisation remains the definitive management and significantly improves patient outcomes.

List of Abbreviations

PCC: Pheochromocytoma
CT: Computed Tomography
HU: Hounsfield Unit
ALT: Alanine Aminotransferase
AST: Aspartate Aminotransferase
ALP: Alkaline Phosphatase
GGT: Gamma-Glutamyl Transferase
HbA1c: Glycated Haemoglobin
OGTT: Oral Glucose Tolerance Test
IU: International Unit
q.d.: Quaque Die (Once Daily)
q12h: Every 12 hours

Declaration

Ethics approval and consent to participate

Written informed consent for publication was obtained from the patient whose management is being reported

Consent for publication

All the authors consented to publishing the work under the Creative Commons Attribution-Non-Commercial 4.0 license.

Availability of data and materials

The essential data supporting this study's findings are available within the article. For confidential reasons, additional data are available upon request from the corresponding author.

Competing interests

The authors declare that they have no competing interests

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Author's contributions

All authors were involved in the management of the patient and conceptualisation of the report. OVC, OOA, IPI, EOD, OCN, OJ, and AOC wrote the first manuscript.

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References

1. Abukhaled J, Balinski AM. Benign phaeochromocytoma presenting with recurrent spells and negative biochemical screening. BMJ Case Reports CP. 2022 Aug 1;15(8):e251113. https://doi.org/10.1136/bcr-2022-251113
2. Emuze ME, Esan A, Adeleye J, Ifeh MO, Takure A, Akande T, Balogun W, Lawal AO. Extra-adrenal phaeochromocytoma in a resource poor setting: A case report. Endocrine Regulations. 2022 Feb 18;56(1):48-54. https://doi.org/10.2478/enr-2022-0006
3. Fassnacht M, Assie G, Baudin E, Eisenhofer G, De La Fouchardiere C, Haak HR, De Krijger R, Porpiglia F, Terzolo M, Berruti A. Adrenocortical carcinomas and malignant phaeochromocytomas: ESMO–EURACAN Clinical Practice Guidelines for diagnosis, treatment and follow-up. Annals of Oncology. 2020 Nov 1;31(11):1476-90. https://doi.org/10.1016/j.annonc.2020.08.2099
4. Fang F, Ding L, He Q, Liu M. Preoperative management of pheochromocytoma and paraganglioma. Frontiers in endocrinology. 2020 Sep 29;11:586795. https://doi.org/10.3389/fendo.2020.586795
5. Abe I, Islam F, Lam AK. Glucose intolerance on phaeochromocytoma and paraganglioma—The current understanding and clinical perspectives. Frontiers in Endocrinology. 2020 Nov 26;11:593780. https://doi.org/10.3389/fendo.2020.593780
6. Nölting S, Bechmann N, Taieb D, Beuschlein F, Fassnacht M, Kroiss M, Eisenhofer G, Grossman A, Pacak K. Personalized management of pheochromocytoma and paraganglioma. Endocrine Reviews. 2022 Mar 9;43(2):199-239. https://doi.org/10.1210/endrev/bnab019
7. WALTHER MM, REITER R, KEISER HR, CHOYKE PL, VENZON D, HURLEY K, GNARRA JR, REYNOLDS JC, GLENN GM, ZBAR B, LINEHAN WM. Clinical and genetic characterization of pheochromocytoma in von Hippel-Lindau families: comparison with sporadic pheochromocytoma gives insight into natural history of pheochromocytoma. The Journal of Urology. 1999 Sep 1;162(3):659-64. https://doi.org/10.1097/00005392-199909010-00004
8. Habib MB, Abdelrazek M, Alatasi S, Mohamed MF, Ali H, Hamad MK. Pheochromocytoma presenting with severe abdominal pain and abnormal liver enzymes. Clinical Case Reports. 2021 Aug;9(8):e04640. https://doi.org/10.1002/ccr3.4640
9. Zelinka T, Eisenhofer G, Pacak K. Pheochromocytoma as a catecholamine producing tumor: implications for clinical

practice. Stress. 2007 Jan 1;10(2):195-203. https://doi.org/10.1080/10253890701395896
10. Khan IA, Karim HM, Panda CK, Ahmed G, Nayak S, Khan IA. Atypical presentations of myocardial infarction: a systematic review of case reports. Cureus. 2023 Feb 26;15(2). https://doi.org/10.7759/cureus.35492