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A CASE OF INCIDENTALLY DETECTED LEFT ADRENAL PHEOCHROMOCYTOMA IN AN ELDERLY MALE WITH HYPERTENSION, DIABETES, AND CKD

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Abstract. Pheochromocytoma is a rare catecholamine-secreting tumor of the adrenal medulla that often presents with hypertension and variable systemic manifestations. We report a case of a 71-year-old male with long-standing hypertension and recently diagnosed diabetes mellitus, in whom a left adrenal mass was incidentally detected during evaluation for chronic kidney disease. Biochemical evaluation revealed markedly elevated 24-hour urinary metanephrines, confirming the diagnosis of pheochromocytoma. The patient underwent successful laparoscopic left adrenalectomy following appropriate preoperative preparation. Postoperatively, his blood pressure and glycemic control improved significantly, and renal function showed partial recovery. This case highlights the importance of considering pheochromocytoma in incidentally detected adrenal masses, especially in patients with resistant hypertension.

Keywords: Pheochromocytoma, adrenal incidentaloma, hypertension, laparoscopic adrenalectomy

Introduction

Pheochromocytoma is a tumor arising from catecholamine-producing chromaffin cells of the adrenal medulla and accounts for approximately 0.1–0.6% of cases of hypertension [1]. With the widespread use of cross-sectional imaging, pheochromocytoma is increasingly diagnosed as an adrenal incidentaloma, accounting for about 5–10% of incidentally detected adrenal masses [2]. Excess catecholamine secretion can lead to significant cardiovascular morbidity, making early diagnosis and appropriate perioperative management essential [3].

Case Presentation

A 71-year-old married male was admitted for evaluation of a left adrenal mass. The mass was incidentally detected two months earlier during radiological investigations performed for raised serum creatinine levels.

Medical History

The patient had a 20-year history of hypertension, which had become increasingly difficult to control over the past eight months, requiring three antihypertensive agents. He was diagnosed with diabetes mellitus eight months prior, following complaints of blurring of vision. There was no history of hematuria, pyuria, hemoptysis, bone pain, jaundice, or weight loss. He had previously undergone CT-guided FNAC of the adrenal mass before referral.

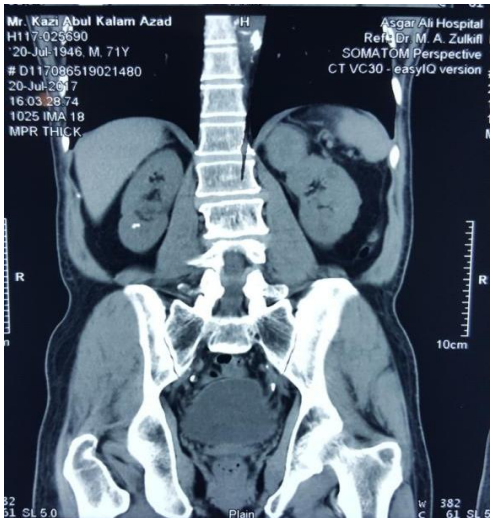
Examination

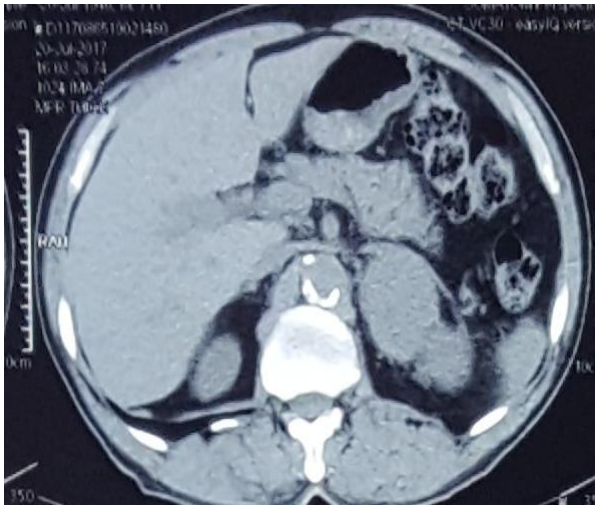
On examination, the patient appeared anxious but was hemodynamically stable with blood pressure of 130/70 mmHg on medication. His BMI was 19.8 kg/m². Systemic examination, including cardiovascular, respiratory, abdominal, genitourinary, and neurological systems, was unremarkable.

Investigations

Laboratory investigations revealed progressive renal impairment with serum creatinine rising from 1.7 mg/dL to 2.07 mg/dL. Glycemic parameters showed HbA1c of 6.9%. Hormonal analysis demonstrated markedly elevated 24-hour urinary metanephrines (7293.77 nmol/24 hr), approximately four times the upper limit of normal, while urinary cortisol and serum electrolytes were normal.

Non-contrast CT scan of the abdomen revealed a well-defined left suprarenal mass measuring 5.1 × 4.3 cm with central hypodense necrotic areas, closely adherent to the left kidney. Based on clinical, biochemical, and radiological findings, a diagnosis of left adrenal pheochromocytoma was made.

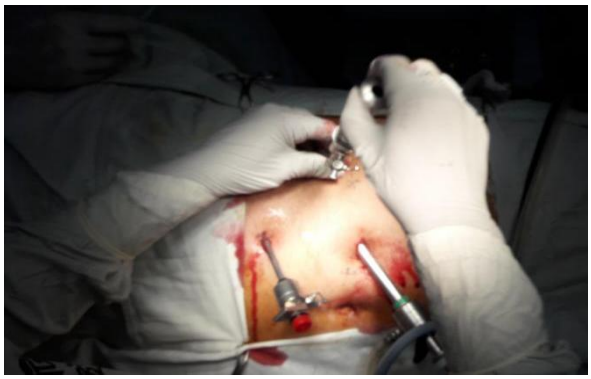
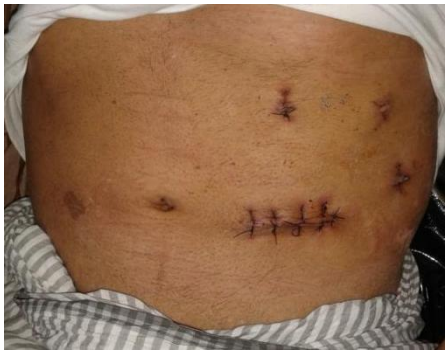




Management

The patient was optimized preoperatively with alpha-adrenergic blockade (prazosin), beta-blockade, calcium channel blockers, strict glycemic control using insulin, and intravascular volume expansion. Multidisciplinary consultations with anesthesia, medicine, and nephrology were obtained.

He underwent laparoscopic left adrenalectomy under general anesthesia in a modified lateral position. Intraoperatively, dense adhesions were encountered, likely due to prior FNAC. The left adrenal vein was carefully isolated and ligated. Significant blood pressure fluctuations were observed during tumor manipulation, requiring close anesthetic management with fluids and vasopressors.

Outcome and Follow-Up

Postoperatively, the patient was monitored in the ICU. He initially remained hypertensive but was subsequently controlled on a single calcium channel blocker. Glycemic control improved from the third postoperative day, requiring reduced insulin doses. Serum creatinine decreased to 1.7 mg/dL. Histopathological examination confirmed a benign pheochromocytoma. The patient was discharged in stable condition with advice for medical follow-up and long-term biochemical surveillance.

Discussion

Pheochromocytoma, though uncommon, remains one of the most important surgically curable causes of secondary hypertension [1]. In recent years, the widespread use of abdominal imaging has shifted the way these tumors are detected, with many cases now identified incidentally rather than through their classic symptomatic presentation [2]. Our patient is a good example of this changing pattern. Despite long-standing hypertension and recently diagnosed diabetes, he did not report the typical triad of headache, palpitations, and diaphoresis. This underscores how easily pheochromocytoma can be overlooked and highlights the need for clinical vigilance, particularly in patients with resistant or long-standing hypertension [4].

MANIFESTATION	FREQUENCY (%)
Headache	60-90
Palpitations	50-70
Sweating	55-75
Pallor	40-45
Nausea	20-40
Flushing	10-20
Weight loss	20-40
Tiredness	25-40
Psychological symptoms (anxity, panic)	20-40
Sustained hypertension	50-60
Paroxysmal hypertension	30
Orthostatic hypotension	10-50
Hyperglycemia	40

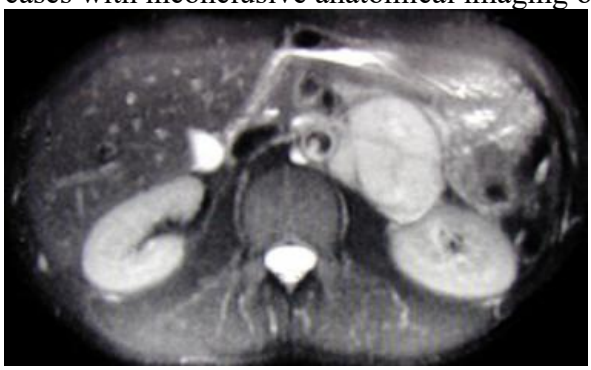
Biochemical confirmation is the cornerstone of diagnosis. Measurement of plasma free metanephrines or 24-hour urinary fractionated metanephrines is currently considered the most sensitive diagnostic approach, as catecholamine metabolism within the tumor occurs continuously, even in the absence of symptomatic catecholamine surges [5]. In contrast, urinary

vanillylmandelic acid (VMA), once widely used, has relatively low sensitivity and is no longer recommended as a standalone screening test [5]. In the present case, the markedly elevated urinary metanephrine level provided clear biochemical confirmation and correlated well with the clinical and radiological findings.

Biochemical test	Sensitivity (%)	Specificity (%)
Plasma fractionated metanephrines	96-100	85-100
Plasma NE	78	88
Plasma E	63	79
Urinary catecholamines	70-71	90-99
Urinary metanephrines	71-92	99-100
Urinary VMA	89	85

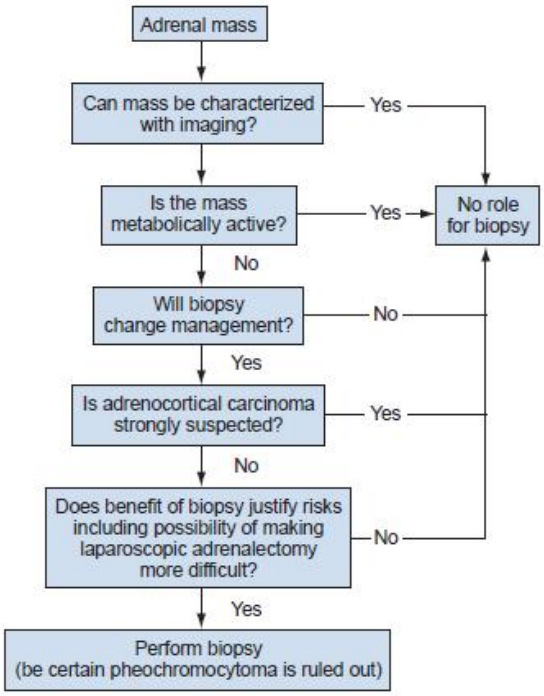
NE:Norepinephrine, E:Epinephrine, VMA:Vanillyl mandelic acid

Imaging studies play a crucial role not only in tumor localization but also in operative planning. On non-contrast CT, pheochromocytomas typically demonstrate attenuation values greater than 10 HU and may show areas of necrosis or hemorrhage, features that help differentiate them from benign lipid-rich adenomas [2]. MRI serves as a valuable alternative in selected patients and is particularly useful in children and pregnant women. The characteristic T2-weighted hyperintensity—the so-called "light bulb sign"—reflects the high water content of these tumors, although it is not universally present and should not be relied upon in isolation [8]. Functional imaging modalities such as 18F-FDG PET or 123I-MIBG scanning are generally reserved for cases with inconclusive anatomical imaging or when metastatic disease is suspected [9].



MRI scan showing large left suprarenal mass of high signal intensity on a T2-weighted image.

Surgical excision remains the definitive treatment for pheochromocytoma. Laparoscopic adrenalectomy has become the preferred approach for most tumors due to its association with reduced blood loss, less postoperative pain, shorter hospital stay, and faster recovery compared with open surgery [6]. However, prior interventions, large tumor size, or local invasion can make surgery technically demanding. In our patient, dense adhesions—likely related to previous FNAC—added to the operative difficulty. This case reinforces why adrenal biopsy is generally discouraged in suspected pheochromocytoma, given its limited diagnostic yield and potential to increase surgical complexity or precipitate hypertensive crises [2].



Adrenal biopsy should be pursued only when

- limitations of imaging have been reached and
- when the physician and patient are certain that the result of biopsy will influence management.

Perioperative hemodynamic instability remains one of the greatest challenges in the management of pheochromocytoma. Adequate preoperative alpha-adrenergic blockade, followed by beta-blockade when necessary, along with careful intravascular volume expansion, significantly reduces perioperative cardiovascular complications [3,7]. Despite optimal preparation, marked blood pressure fluctuations may still occur during tumor manipulation and after adrenal vein ligation, as was observed in this patient. Close coordination between the surgical and anesthesia teams is therefore essential for safe outcomes.

Following tumor removal, many patients experience improvement or resolution of hypertension and glucose intolerance, reflecting the elimination of chronic catecholamine excess [1]. In this case, the gradual reduction in antihypertensive requirements and improvement in glycemic control mirrored this expected postoperative course. Given the risk of recurrence or late metastatic disease, lifelong follow-up with periodic biochemical testing remains mandatory, even after apparently complete resection [5,7].

Conclusion

This case underscores the importance of evaluating adrenal incidentalomas for functional tumors, particularly in patients with resistant hypertension. Timely diagnosis and appropriate surgical management of pheochromocytoma can lead to significant improvement in blood pressure, glycemic control, and overall prognosis.

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