ORIGINAL RESEARCH PAPER
Volume - 11 | Issue - 10 | October - 2022 | PRINT ISSN No. 2277 - 8179 | DOI : 10.36106/ijsr
INTERNATIONAL JOURNAL OF SCIENTIFIC RESEARCH

PHEOCHROMOCYTOMA - THE GREAT MASQUERADER

Internal Medicine

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ABSTRACT

Pheochromocytomas and paragangliomas are catecholamine producing tumours derived from the sympathetic or parasympathetic nervous system. Although the classic triad of symptoms are episodic headache, sweating and palpitations, it occurs in only 24% of cases. Therefore, unusual presentations of PHEO seem to be more prevalent than previously thought. Exceptionally, PHEO can present as seizures. Here, we report a rare presentation of an adrenal PHEO in a 35yr old female as seizures. A 35yr old female was brought to our emergency with H/O 3 episodes of GTCS within a duration of 1 hr, regained full consciousness after 2-3hrs. On admission, her physical examination was normal except for elevated BP. Neurological examination revealed a confused female with no signs of meningeal irritation with intact cranial nerves and normal sensory and motor components, without any neuro cutaneous markers. With a suspicion of PHEO, the patient was evaluated. Routine investigations were normal except for elevated 24hrs urinary metanephrine levels and CECT Abdomen revealed a well-defined soft tissue lesion measuring 4.5*2.9*3,7 cm with average HU 100 in left adrenal gland. After the diagnosis of PHEO, Phenoxybenzamine, an α blocker along with β blockers were used for BP control and volume repletion was done. After stabilization, patient was taken up for surgery, and complete left adrenalectomy was done. Biopsy of the resected tissue was consistent with PHEO. Post op course was uneventful.

KEYWORDS

INTRODUCTION

Pheochromocytomas (PHEO) and extra adrenal paragangliomas are rare neuroendocrine tumors arising from chromaffin cells of the adrenal medulla or the sympathetic ganglia anywhere in the body. Approximately 10% to 20% of these tumours are diagnosed during childhood at an average age of 11 years with a slight male predominance, particularly under the age of 10.[1] PHEOs are characterized by excessive amounts of catecholamines responsible for hypertensive surges, headache, and excessive sweating.[2] The most common sign is hypertension, found in approximately 90% of patients with PHEO.[3] Clinical characteristics of hypertension in PHEO patients vary and may show either a sustained or a paroxysmal pattern.[4] More rarely, some patients present with hypotension, especially severe orthostatic with syncope.[5,6] Exceptionally, a presenting symptom of PHEO may be seizures, as reported in a few cases in the literature.[7,8] Here, we report a rare initial presentation of an adrenal PHEO in a previously healthy 32-year-old in whom a generalized tonic clonic seizure is believed to be caused by the presence of an adrenal PHEO.

CASE PRESENTATION

A 35yr female was brought to our emergency with a H/O 3 episodes of Generalized Tonic Clonic Seizures within a duration of 1 hr, regained full consciousness after 2-3hrs.

Patient never had any history of headache or palpitations or sweating.

No history of panic attacks, abdominal pain, weight loss, orthostatic hypotension

No H/O DM, HTN, CAD, CVA, TB, ASTHMA

On the day of admission her vitals were as follows.

BP 180/110mmHg to 210/130mmHg, Pulse 118 beats per minute, Temp – 37.4 °C, Resp rate 22 breaths per minute. On admission, her physical examination was normal except for elevated BP. Neurological examination revealed a confused female with no signs of meningeal irritation with cranial nerves intact with normal sensory and motor components without any neurocutaneous markers.

After a provisional diagnosis of PHEO, Phenoxybenzamine was used for BP control and volume repletion was done. After stabilization, patient was taken for surgery, complete left adrenalectomy was done. Biopsy of the resected tissue was consistent with PHEO. Post op course was uneventful, Blood Pressure came down to normal, patient was discharged on post op day 12 without any complaints.

CLINICAL COURSE

Blood Tests	Hb 12mg/dl WBC 8,253/ul Plts 2.3 lacs/ul Sr. Cr 1.2 mg/dl Urea 28 mg/dl Sr. Calcium 9.6 mg/dl Sr. PO4 3.9 mg/dl (3.4 – 4.5) Sr. TSH 4.6 mU/ml Sr PTH Levels 36 pg/dl (10 – 55) Sr. Calcitonin 6.3 pg/ml (<10)
Urine analysis	24hrs urine collection for metanephrine levels 2600mcg/24hrs (0.0-900)
EEG	Normal study
CT Brain and MRI Brain	S/O Cerebral edema
CECT Abdomen	(Fig3). A well defined soft tissue lesion measuring 4.5*2.9*3,7 cm with average HU 100 in left adrenal gland. Absolute washout – 58.6% Relative washout 36%
HISTOPATHOLOGY OF RESECTED SPECIMEN	(Fig2). a well-circumscribed mass composed of large, polygonal cells with abundant delicate, granular cytoplasm with a round to oval nuclei with prominent nucleoli. The tumor cells were arranged in a solid and trabecular pattern

After 12 months of follow up, patient was doing well without any complications such as tumor recurrence, High BP recordings or seizures.

PRINT ISSN No. 2277 - 8179 | DOI : 10.36106/ijsr

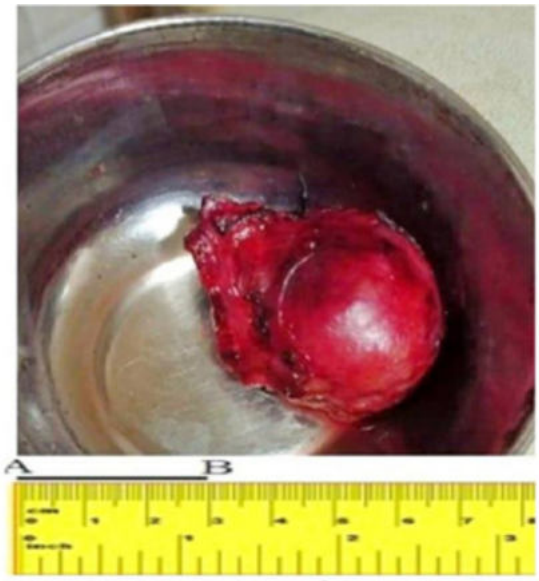


Image showing specimen of the resected tumour

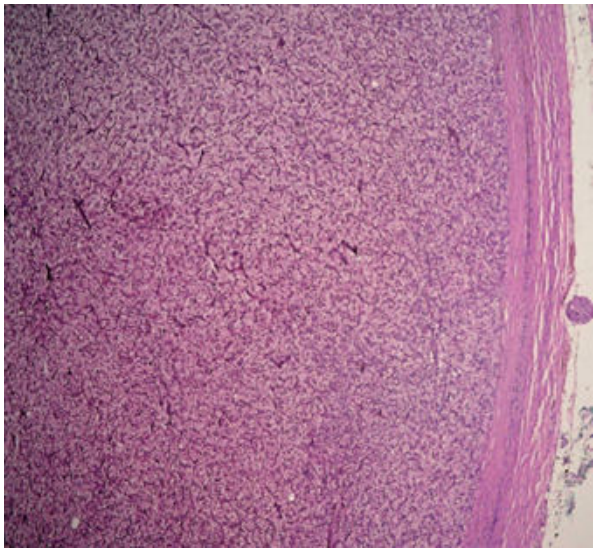
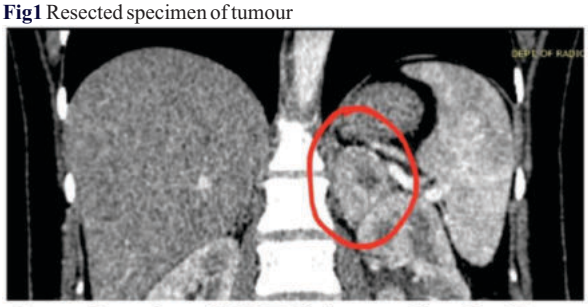


Fig1 Resected specimen of tumour



Coronal section of CECT Abdomen Showing Hyper Enhancing lesion in the Left supra renal region.

Fig2 Histopathology Slide Of The Tumor

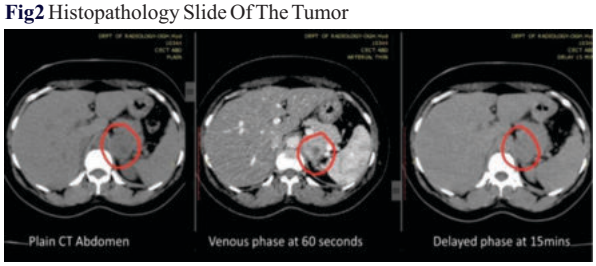


Fig3CECT ABDOMEN showing hyper enhancing lesion in the left suprarenal gland

DISCUSSION

Its clinical presentation is so variable that pheochromocytoma has been termed "the great masquerader". Although the classic triad of symptoms in episodic headache, sweating, and palpitations is presented as typical, it occurs in only 24% of cases. The symptoms and signs of PHEO are extremely variable, ranging from asymptomatic to cardiac arrest.[4] . Therefore, unusual presentations of PHEO seem to be more prevalent than previously thought. Various other symp toms that may manifest as episodic or continuous include severe anxiety, tremulousness, pain (chest, abdomen, lumbar, and groin), nausea, vomiting, weakness, fatigue, weight loss, warmth or heat intolerance, dyspnea, paresthesia, pallor of the face and upper body, and visual impairment.[9]. . Data from the literature suggest that the occurrence of seizures may be related to the high catecholamines, to hypertensive encephalopathy or brain tumors.[10] Rare cases of the seizures as the presenting symptoms of PHEO have been described in adults. CNS manifestations are rare in PHEO. Cerebral ischaemia and symptoms of stroke were rarely described in patients with phaeochromocytoma. [4,5] The diagnosis is based on documentation of catecholamine excess by biochemical testing and localization of the tumor by imaging. These two criteria are of equal importance, although measurement of catecholamines or metanephrines (their methylated metabolites) is traditionally the first step in diagnosis.

When pheochromocytoma is suspected on clinical grounds (i.e., when values are three times the upper limit of normal), this diagnosis is highly likely regardless of the assay used.

Urinary tests for metanephrines (total or fractionated) and catecholamines are widely available and are used commonly for ini¬tial evaluation. Among these tests, those for the fractionated metanephrines and catecholamines are the most sensitive. Plasma tests are more conve¬nient and include measurements of catecholamines and metanephrines.

Measurements of plasma metanephrine are the most sensitive and are less susceptible to false-positive elevations from stress, including venipuncture.

Because the tumors are relatively rare, borderline elevations are likely to represent false-positive results. In this circumstance, it is important to exclude dietary or drug-related factors (withdrawal of levodopa or use of sympathomimetics, diuretics, tricyclic anti¬depressants, alpha and beta blockers) that might cause false-positive results and then to repeat test¬ing or perform a clonidine suppression test (i.e., the measurement of plasma normetanephrine 3 h after oral administration of 300 μg of clonidine).

CT and MRI are similar in sensitivity and should be performed with contrast. T2-weighted MRI with gadolinium contrast is optimal for detecting pheochromocytomas and is somewhat better than CT for imaging extraadrenal pheochromocytomas and paragangliomas.

Complete tumor removal, the ultimate therapeutic goal, can be achieved by partial or total adrenalectomy.

Preoperative preparation of the patient has to be considered, and blood pressure should be consistently <160/90 mmHg. Classically, blood pressure has been controlled by α-adrenergic blockers (oral phenoxybenzamine, 0.5–4 mg/kg of body weight). Because patients are volume-constricted, liberal salt intake and hydration are necessary to avoid severe ortho¬stasis. Oral prazosin or intravenous phentolamine can be used to manage paroxysms while adequate alpha blockade is awaited. Beta blockers (e.g., 10 mg of propranolol three or four times per day) can then be added. Other antihypertensives, such as calcium channel blockers or angiotensin-converting enzyme inhibitors, have also been used effectively.

Postoperatively, catecholamine normalization should be documented. An adrenocorticotropic hormone (ACTH) test should be used to exclude cortisol deficiency when bilateral adrenal cortex– sparing surgery has been performed.

The impairment of cerebral blood flow that underlies hypertensive encephalopathy is still controversial. Normally, cerebral blood flow is maintained by an autoregulation mechanism that dilates arterioles in response to blood pressure decreases and constricts arterioles in response to blood pressure increases. This autoregulation falters when

hypertension becomes excessive. According to the over-regulation conception, brain vessels spasm in response to acute hypertension, which results in cerebral ischemia and cytotoxic edema. According to the autoregulation breakthrough conception, cerebral arterioles are forced to dilate, leading to vasogenic edema.

Hypertensive encephalopathy is defined as acute brain dysfunction such as severe headache, changes in consciousness, seizure, and retinal hemorrhage induced by sustained severe hypertension. The etiologies of hypertensive encephalopathy are well identified, but the exact pathophysiology of hypertensive encephalopathy has not been established. However, it can be explained in 2 concepts. First, according to autoregulation breakthrough conception, cerebral arterioles are forced to dilate, leading to vasogenic edema. Second, in overregulation conception, brain vessel spasm in response to acute hypertension results in cerebral ischemia and cytotoxic edema. Overregulation conception is thought to be related to the release of humoral vasoconstrictors that are normally increased when hypertension occurs. The latter concept is explained as the cause of the most characteristic posterior reversible encephalopathy syndrome (PRES) lesion. In hypertensive encephalopathy, brain edema can cause stimulation of stretch receptors in the fourth ventricle, which can make the hypertension worse8). These theories suggest that hypertensive encephalopathy can have different characteristics depending on the underlying diseases, because each etiology has a different contributing factor for hypertension.

CONCLUSION

The clinical features of phaeochromocytoma are because of catecholamine secretion. Hypertension is the most common manifestation. [11] It may either be sustained and poorly responsive to therapy or paroxysmal ('hypertensive crises'). The classical clinical findings of headaches, profuse sweating, tachycardia, nervousness, pallor and fever accompanied by hypertension are well known .[12] However, recognition of unusual presentation is less known but not less important because phaeochromocytoma is one of the curable forms of hypertension.

In conclusion, PHEO should be considered in the differential diagnosis of children presenting with seizures at the emergency departments. All unexplained conditions presenting with seizures and hypertension should have a high index of suspicion for the presence of PHEO in both adults and children, requiring a multidisciplinary approach to evaluation and treatment.

REFERENCES:

[1] Waguespack SG, Rich T, Grubbs E, et al. A current review of the etiology, diagnosis, and treatment of pediatric pheochromocytoma and paraganglioma. J Clin Endocrinol Metab 2010;95:2023–37.
[2] Prejbisz A, Lenders JW, Eisenhofer G, et al. Cardiovascular manifestations of phaeochromocytoma. J Hypertens 2011;29:2049–60.
[3] Manger WM. The protean manifestations of pheochromocytoma. Horm Metab Res 2009;41:658–63.
[4] Gu YW, Poste J, Kunal M, et al. Cardiovascular manifestations of Pheochromocytoma. Cardiol Rev 2017;25:215–22.
[5] Bortnik M, Occhetta E, Marino P. Orthostatic hypotension as an unusual clinical manifestation of pheochromocytoma: a case report. J Cardiovasc Med (Hagerstown) 2008;9:839–41.
[6] Ueda T, Oka N, Matsumoto A, et al. Pheochromocytoma presenting as recurrent hypotension and syncope. Intern Med 2005;44:222–7.
[7] Leiba A, Bar-Dayan Y, Leker RR, et al. Seizures as a presenting symptom of phaeochromocytoma in a young soldier. J Hum Hypertens 2003 73–5.;17:
[8] Lee YJ, Yeon GM, Kim YM, et al. Case 2: severe headache and paroxysmal seizures in a 14-year-old boy with cyclic vomiting syndrome. Paediatr Child Health 2015;20:69–71.
[9] Manger WM. Diagnosis and management of pheochromocytoma— recent advances and current concepts. Kidney Int 2006;70: S30–35.
[10] Jadoul M, Leo JR, Berends MJ, et al. Pheochromocytoma-induced hypertensive encephalopathy revealing MEN-IIa syndrome in a 13-year old boy. Implications for screening procedures and surgery. Horm Metab Res Suppl 1989;21:46–9.
[11] Kebebew E, Duh QY. Benign and malignant pheochromocytoma: diagnosis, treatment, and follow-up. Surg Oncol Clin N Am 1998; 7: 765–789.
[12] Walther MM, Keiser HR, Linehan WM. Pheochromocytoma: evaluation, diagnosis, and treatment. World J Urol 1999; 17: 35–39.