Case Report

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Adrenal Incidentaloma: A Rare Presentation and Anaesthetic Implications

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Abstract

Pheochromocytomas are rare tumors which most commonly present with paroxysmal hypertension, headache, diaphoresis and palpitation. Very rarely, they are diagnosed incidentally on abdominal ultrasound or CT scan done for some other purpose, following which rose urinary and plasma levels of catecholamines and metanephrines are discovered. Some small tumors are non-secretory, clinical asymptomatic and are resected uneventfully without any haemodynamic fluctuations intraoperatively. We report a rare case wherein the patientwas asymptomatic, with normal endocrinology, diagnosis was non-secretory suprarenal tumor but there were wide fluctuations in blood pressure and heart rate corresponding to handling of tumor mass. On histopathology, the tumorturned out to be a malignant pheochromocytoma.

Keywords: Pheochromocytoma; Asymptomatic; Adrenal; Incidentaloma.

Introduction

Diagnosis of pheochromocytoma is based on clinical presentation along with endocrinological assessment. Anaesthetic management of pheochromocytoma mandates preoperative optimisation with alpha and beta blockers with fluid resuscitation in order to avoid life-threatening complications intra-operatively. We report a rare case of adrenal incidentaloma, wherein the patient was asymptomatic and the 24 hour urinary catecholamines, metanephrines and VMA (vanillylmandelic acid) were within normal limits but intra-operative there were wide fluctuation in hemodynamics and it turned out to be malignant pheochromocytoma on histopathology.

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Case history

A 45 year old, normotensive, non-diabetic male weighing 60 kg presented to the surgical OPD with chronic abdomen pain. History and examination were unremarkable besides dull aching pain in lower left abdomen. CECT abdomen revealed a 3.4cm×3.1cm×4cm suprarenal mass (figure 1). There was no history of paroxysmal headache, flushing, excessive sweating or palpitation. There was no family history of pheochromocytoma or MEN syndrome. Twenty four hour urine metanephrines, catecholamines and VMA were within normal limits. Plasma epinephrine and nor-epinephrine were also within normal limits. Hence, a diagnosis of non-secretory suprarenal mass was made and surgical excision was decided.

Pre-anaesthetic examination was unremarkable. There were no co-morbidities and the patient was not on any chronic medication. Inside the operation theatre, baseline monitoring including ECG, NIBP, pulse oximeter were instituted. Baseline heart rate was 90bpm and blood pressure was 130/80mmHg. Anaesthesia was induced using fentanyl 120µg, midazolam 2mg and propofol150mg iv. Intubation was facilitated with vecuronium 6mg iv. Maintenance was done with isoflurane, O_2, N_2O and supplemental dose of fentanyl and vecuronium as per the requirement. The intra-operative course was uneventful and vitals were within normal limits until the time the surgeon started handling the tumor. There was a sudden increase in the blood pressure to 200/120mmHg and heart rate to 140bpm,

isoflurane concentration was increased, additional doses of fentanyl and vecuronium were given, still the BP was 190/110mmHg and heart rate was 130bpm. Surgeon was notified and asked to stop the surgery for some time, BP and HR gradually came down to 140/90mmHg and 108bpm respectively within 5 minutes. But, once the surgery was restarted, the BP and HR again rose to 200/100mmHg and 120bpm respectively. Hence, we came to a conclusion that the tumor might be an undiagnosed or subclinical pheochromocytoma. Any alpha blocker was not immediately available, hence nitroglycerine and esmolol infusion were started. Both the BP and HR were controlled effectively with the infusions. Intra-operative blood sugar levels were WNL. Central venous pressure monitoring was instituted with a catheter in right internal jugular vein, and the pressure was maintained between 10-12cmH_2O. Left radial artery was cannulated for continuous monitoring of BP.

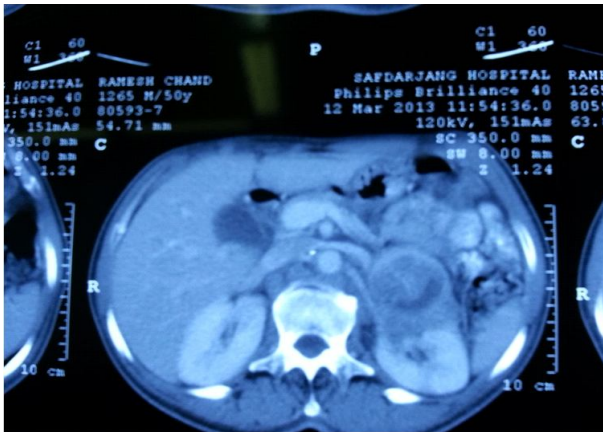

Fig. 1: CECT abdomen shows a 3.4cm×3.1cm×4cm suprarenal mass.

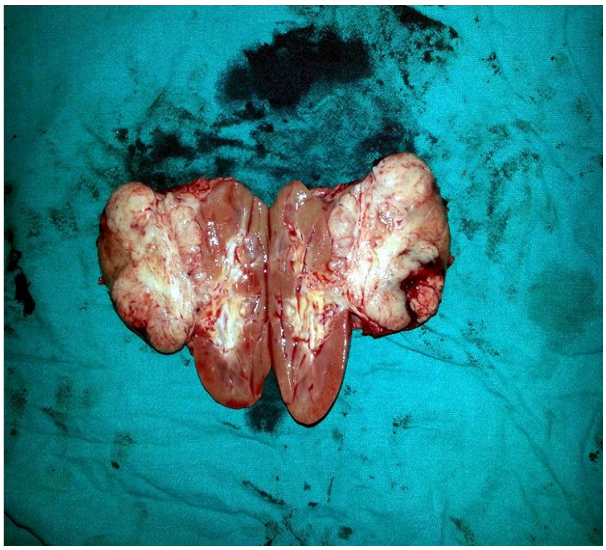

Fig. 2: Photograph of the tumor

As expected, after ligatingthe tumor blood supply, BP crashed to 80/50mmHg from 140/80mmHg, HR dropped from 90bpm to 70bpm. Esmolol and nitroglycerine infusions were stopped,iv fluidwas given fast and nor-adrenaline infusion was started. Rest of the course was uneventful and nor-adrenaline infusion was slowly tapered. The mass was found to be invading renal pelvis, hence the tumor mass along with right kidney had to be removed (figure 2). At the end of the surgery, trachea was extubated after signs of adequate reversal were observed. Nor-adrenaline infusion had to be continued at the rate of 1.5µ/kg/min to maintain BP to a level of 120/78mmHg. The HR was stable between 70-90bpm. The patient was shifted to intensive care unit for monitoring and further management. Post-operative samples were also sent for plasma catecholamines and urine VMA and metanephrines and were within normal limits. Blood sugar and thyroid function tests were WNL. The noradrenaline infusion was tapered and turned off over the next two days. Rest of the post-operative course was uneventful. The histopathological report of the tumor resected confirmed the diagnosis of locally malignant pheochromocytoma, invading the renal pelvis. On follow-up visits, the patient was normotensive with normal sugar levels.

Discussion

With easy accessibility of various diagnostic radiological techniques, incidentalomas are now more frequently diagnosed. Adrenal incidentalomas are described as adrenal lesions that are incidentally diagnosed during abdominal laparotomy or any abdominal screening without prior suspicion of adrenal disease. It is important to diagnose adrenal lesions to learn if they are hormonally active or malignant [11].

The most common clinical presentation of pheochromocytoma is sustained or paroxysmal hypertension, headache, excessive truncal sweating and palpitation. In our case, there were no such signs and symptoms. Still, urinary catecholamines, VMA and metanephrine levels and plasma catecholamine levels were assessed to rule out a subclinical pheochromocytoma. These were also within normal range. Hence, the diagnosis of asymptomatic, non-functioning adrenal tumor was made.

Literature states that incidental pheochromocytoma that are larger than 1 cm are mostly symptomatic [12]. In our case, the tumor dimensions were 3.4cm×3.1cm×4cm, however it was still asymptomatic, hence not expected to be a pheochromocytoma.

There are no specific recommendations in contemporary literature as to the pre-operative preparation of non-secretory, asymptomatic incidentaloma in normotensive individuals with normal biochemical and endocrinological profile. Hence, the preoperative evaluation and preparation of such patients is usually as per the discretion of the attending anaesthesiologists. Based on clinical presentation and investigations, we ruled out the possibility of pheochromocytoma in our case and did not attempt pre-operative optimisation with any antihypertensive drug.

MesutOzkaya and co-workers reported a case in which adrenal mass of dimension 3.6 × 3.5 × 3.5 cm was discovered incidentally on abdominal CT scan. Patient was asymptomatic and with normal endocrinological screening similar to our case. However, the intraoperative course in that patient was unlike ours and uneventful throughout the surgery [4]. On post-operative histopathology report, the tumor was diagnosed to be a pheochromocytoma.

In another case report, the patient was symptomatic for pheochromocytoma, presenting with paroxysmal hypertension with a 4.5cm left adrenal mass on CT scan, though repeated preoperative measurements of 24-hour urinary fractionated metanephrines, total catecholamines and VMA were within normal range. After adequate preoperative treatment, successful surgical excision of the tumor was performed uneventfully and the pathological examination confirmed the diagnosis of a cystic pheochromocytoma with a 2cm solid tumor [5].

Plasma metanephrine levels were not done in any of the above cases due to unavailability. Measurement of metanephrine in the urine has traditionally been considered to be the most useful test [6]. However , it has been proved that tests for plasma metanephrines are more sensitive than tests for plasma catecholamines or urinary metanephrines for the diagnosis of pheochromocytoma. The sensitivity and negative predictive value of plasma metanephrine are 100% each. Whereasthe sensitivity of urinary metanephrinesis 89% [7]. In particular, the high sensitivity of plasma free metanephrines means that a normal test result reliably excludes all but the smallest of pheochromocytomas so that no other tests are necessary [9].

Pheochromocytomas, although a rare cause of hypertension, are dangerous tumors. The inadequacyof commonly used biochemical tests, make excluding or confirming the diagnosis of the tumor, an often difficult and time consuming task. Recognition that catecholamines are metabolized to free metanephrines within pheochromocytoma tumor cells, and that this process is independent of catecholamine release, provides a rationale for use of these metabolites in the biochemical diagnosis of pheochromocytoma. Measurements of plasma concentrations of free metanephrines thereby promise more reliable and efficient diagnosis of pheochromocytoma than offered by conventional biochemical tests [8].

Surgery for pheochromocytomais fraught with wide swings in haemodynamics during perioperative period, unless the patient is well prepared preoperatively.These patients are hypertensives, vasoconstricted and severely volume depleted.The preoperative preparation of pheochromocytoma is mandatory with the use of alpha and / or beta adrenergic blocking agents and volume expansion with preoperative intravenous fluids. Extensive preoperative preparation, intra-operative vigilance, timely intervention and communication and co-ordination with the surgeon are paramount in managing a case of pheochromocytoma. Most anaesthesiologist come across a patient with pheochromocytoma once or twice in lifetime. Reports of an undiagnosed pheochromocytoma being confirmed later on biopsy are even fewer.

To conclude, we recommend that plasma metanephrine levels to be done in all suspected cases of adrenal tumors even if asymptomatic. Where it is not available, preoperative preparation protocol as per pheochromocytoma is followed in order to avoid life-threatening hemodynamic fluctuations intraoperatively.

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