

# Unexpected intra-operative diagnosis of a large cystic pheochromocytoma and secondary nifedipine pharmacobezoar

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Cystic pheochromocytoma is a rare neuro-endocrine tumour that is frequently asymptomatic and often diagnosed incidentally on imaging or intra-operatively. A pharmacobezoar is a rare complication of extended-release drug delivery systems. We present a case of a 70-year-old woman diagnosed intra-operatively with cystic pheochromocytoma and antihypertensive pharmacobezoar.

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Cystic adrenal masses are rare and usually non-functioning, but radiological distinction between cystic lesions of the right adrenal and more common cystic liver lesions can prove difficult. The possibility of pheochromocytoma (PCC) should be considered for any peri-adrenal mass because of the high risk of surgery on unprepared patients. Pharmacobezoars are an uncommon complication of extended-release drug delivery systems, but should be considered in patients presenting with bowel obstruction who are utilising extended-release medications.

We present the case of a 70-year-old woman with an incidentally discovered, asymptomatic right upper quadrant cystic mass and a 6-month history of intermittent small-bowel obstructive symptoms. Cystic PCC and extended-release nifedipine pharmacobezoar were diagnosed intra-operatively.

## Case report

A 70-year-old woman was admitted to hospital for investigation of crampy abdominal pain, hypercalcaemia, and postprandial nausea and vomiting suggestive of intermittent bowel obstruction. Her medical history included hypothyroidism and hypertension. There was no prior surgical history of note. Her medications included nifedipine XL, losartan, hydrochlorothiazide and levothyroxine. An echocardiogram was ordered for investigation of a systolic murmur, and a right upper quadrant abdominal mass was unexpectedly found.

An abdominal computed tomography (CT) scan showed a complex, predominantly cystic lesion in the right upper quadrant,

measuring 12×11×10 cm. The lesion had multiple septations and mural nodules and was intimately associated with the right hepatic lobe, displacing the kidney inferomedially (Fig. 1). Radiographically it was not possible to localise the lesion accurately to either the liver or the adrenal gland. Distended loops of small bowel containing dense faecal-like material were noted and attributed to residual contrast from a previous small-bowel contrast study.

The differential diagnosis included cystic hydatid disease of the liver, biliary cystadenoma or cystadenocarcinoma, and a cystic adrenal neoplasm. There were no signs or symptoms suggestive of sepsis and *Echinococcus* serology was negative. The results of liver function tests and enzyme levels were within normal limits. The patient consented to surgical exploration because of diagnostic uncertainty and ongoing symptoms.

Intra-operatively the tumour was found to be loosely adherent to the liver and fixed to the retroperitoneum, with venous branches draining directly into the inferior vena cava. The patient became



Fig. 1. Coronal reconstructed intravenous contrast-enhanced CT image demonstrating multiseptated cystic mass with nodular enhancing components above the right kidney, displacing the kidney inferiorly. The mass appears inseparable from the right hepatic lobe.

hypertensive with tumour manipulation, and at this point the clinical diagnosis of PCC was made. The blood pressure stabilised with phentolamine and the venous drainage of the tumour was divided. *En bloc* tumour resection with the right adrenal gland was performed without complication.

Once the adrenal tumour had been removed, a full laparotomy was performed. A distended segment of the small bowel was identified, with numerous palpable intraluminal objects giving a bean-bag consistency. An enterotomy was made and 139 drug casings were removed proximal to a small-bowel stricture. The strictured segment was resected and primarily re-anastomosed; subsequent pathology results indicated a benign enteric stricture. The retrieved capsules had monographs consistent with the nifedipine XL that the patient had been taking for her hypertension.

The patient's postoperative course was uneventful, and she was discharged 4 days later. Her blood pressure remained normal during her hospital stay and antihypertensives were not required.

Histological examination confirmed the presence of a chromaffin cell-based lesion arising from the adrenal medulla, arranged in trabecular architecture with cyst formation. The neoplastic cells were strongly positive to chromogranin A, confirming their neuro-endocrine lineage.

## Discussion

PCCs are rare catecholamine-producing tumours thought to arise from chromaffin cells in the adrenal medulla. Traditional teaching includes the 'rule of 10s', with 10% incidence of asymptomatic, multiple, bilateral, extra-adrenal, malignant and hereditary PCC. Hypertension, frequently refractory to medical management, is the most common symptom. Headache, palpitations and diaphoresis are the classic triad of symptoms, and occur in 64 - 80% of cases.<sup>1</sup> Cystic PCCs are even rarer tumours, comprising approximately 19% of all PCCs and 5% of cystic adrenal lesions.<sup>2</sup> There are several reports of malignant cystic PCC in the literature.<sup>3</sup> Whereas solid PCCs usually present with a combination of the typical symptoms, cystic PCCs may not, nor are they necessarily associated with elevated serum or urine catecholamines.<sup>4</sup> A 2005 review found only 16 case reports of pure cystic PCC in the literature. Six of those patients were symptomatic upon presentation, and in 6 cases PCC was not suspected until, as in our case, intra-operative haemodynamic instability occurred.<sup>5</sup> A 2008 review of 15 cases of cystic PCC found that the majority were in women, half were asymptomatic, and half had no biochemical abnormalities.<sup>2</sup>

Our patient had longstanding hypertension but no other symptoms of PCC. Her abdominal pain and bowel obstructive symptoms were thought to be unrelated to PCC and secondary to pharmacobezoar.

After the diagnosis of PCC had been made, retrospective review of the imaging by radiologists did not change the impression of possible hepatic origin of this mass. In several of the reported cases, cystic PCC has been radiographically incorrectly diagnosed as pancreatic or liver tumours, with the correct diagnosis only being confirmed at time of surgery.<sup>5,6</sup>

Nifedipine XL utilises a gastrointestinal therapeutic system (GITS), which is a two-layered tablet with a non-absorbing shell, an osmotically active push layer, and an active drug layer. Several cases of nifedipine XL bezoar are reported in the literature, with surgery or stenosis of the gastrointestinal tract identified as risk factors.<sup>7</sup> In our case, a small-bowel follow-through demonstrated smooth, discoid filling defects not initially identified as foreign bodies. These intraluminal densities were seen on abdominal CT and incorrectly attributed to barium residue from a previous study. Similar findings in other cases have been undiagnosed or misdiagnosed as cystic pneumatosis intestinalis.<sup>7</sup> In our case, intermittent bowel obstructive symptoms had been present for at least 6 months. There was no prior gastrointestinal surgery, functional disorder, or other identifiable risk factors for pharmacobezoar. A benign inflammatory small-bowel stricture, presumably secondary to mucosal erosion from one or more antihypertensive pills, resulted in retention of a large number of GITS tablets.

## Conclusion

We report what is to our knowledge the first known case of cystic PCC and probable secondary pharmacobezoar. In this patient, the use of nifedipine for control of hypertension, presumably secondary to PCC, resulted in an inflammatory enteric stricture and pharmacobezoar. Both diagnoses were made intra-operatively despite pre-operative abdominal ultrasound, CT and bowel contrast studies. Cystic PCC is frequently undiagnosed prior to surgery and should be included in the differential diagnosis of all juxta-renal cystic lesions. A pharmacobezoar should be considered in patients taking extended-release antihypertensive medication who develop bowel obstructive symptoms, particularly if they have known bowel pathology or prior GI surgery.

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## REFERENCES

1. Klingler P, Fox T, Menke D, Knudsen J, Fulmer J. Pheochromocytoma in an incidentally discovered asymptomatic cystic adrenal mass. *Mayo Clin Proc* 2000;75:517-520. [http://dx.doi.org/10.4065/75.5.517]
2. Andreoni C, Krebs RK, Bruna PC, et al. Cystic pheochromocytoma is a distinctive subgroup with special clinical, imaging and histological features that might mislead the diagnosis. *BJU Int* 2008;101:345-350. [http://dx.doi.org/10.1111/j.1464-410X.2007.07370.x]
3. Costa SR, Cabral NM, Abirão AT, Costa RB, Silva LM, Lupinacci RA. Giant cystic malignant pheochromocytoma invading right hepatic lobe: report on two cases. *Sao Paulo Med J* 2008;126(4):229-231. [http://dx.doi.org/10.1590/S1516-31802008000400008]
4. Malegh Z, Renyyi-Vamos F, Tanyay Z, Kovcs I, Orosz Z. Giant cystic pheochromocytoma located in the renal hilus. *Pathol Res Pract* 1998;2:103-106. [http://dx.doi.org/10.1078/0344-0338-00194]
5. Antedomenico E, Wascher RA. A case of mistaken identity: giant cystic pheochromocytoma. *Curr Surg* 2005;62:193-198. [http://dx.doi.org/10.1016/j.cursur.2004.08.015]
6. Wu JS, Ahya SN, Replogle MD, Singer GG, Brennan DC, Howard TK. Pheochromocytoma presenting as a giant cystic tumor of the liver. *Surgery* 2000;128:482-484. [http://dx.doi.org/10.1067/msy.2000.104113]
7. Yeen WC, Willis IH. Retention of extended release nifedipine capsules in a patient with enteric stricture causing recurrent small bowel obstruction. *South Med J* 2005;98:839-842. [http://dx.doi.org/10.1097/01.smj.0000173085.76821.11]