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Abdominal Paraganglioma Associated With MEN 2A

Paraganglioma abdominal asociado a MEN 2A

A 48-year-old woman, with no known family history of MEN-2A syndrome, underwent surgery for a thyroid nodule in April 1989. Total thyroidectomy was performed and the pathology study defined a bilateral medullary thyroid cancer (MTC). Due to the possibility that the patient could be an RET mutation carrier, we ordered genetic studies, suprarenal CT, catecholamines in 24-h urine test and parathyroid study. Calcium, phosphorus and PTH were normal. A mild increase of metanephrines was detected in 24-h urine tests (metanephrines 640 $\mu\text{g}/24\text{ h}$; normal levels 60–350 $\mu\text{g}/24\text{ h}$) and suprarenal CT demonstrated the existence of bilateral suprarenal tumors (right, 1.5 cm; left, 2.5 cm). The genetic study confirmed the RET mutation: c.1901G > A (p.C634Y). Given these findings, bilateral suprarenalectomy was performed.

After 15 years of follow-up without incidents, a new increase in arterial pressure levels was detected along with an increase in 24 h urine catecholamine levels (noradrenaline, 140 $\mu\text{g}/24\text{ h}$ (vn 12–86); adrenaline, 150 $\mu\text{g}/24\text{ h}$ (vn 2–23); normetanephrine, 684 $\mu\text{g}/24\text{ h}$ (vn 120–650); total metanephrine, 2444 $\mu\text{g}/24\text{ h}$ (vn 180–1000); total catecholamine, 289 $\mu\text{g}/24\text{ h}$ (vn 14–110); AVM, 25.6 mg/24 h (vn 1–10). Abdominal CT showed evidence of a mass with a hypodense center measuring 4.5×3 cm in the interaortocaval region above the left renal vein and in close contact with the vena cava (Fig. 1a). The findings of a metaiodobenzylguanidine (MIBG) scintigraphy were compatible with a mass showing increased uptake in the right suprarenal position suggestive of paraganglioma or right pheochromocytoma relapse (Fig. 1b).

The patient, who had previously been prepared with phenoxybenzamine, underwent surgery that revealed a tumor measuring 4–5 cm located in the area between the vena cava, left renal vein and aorta, which was completely removed. There were no post-OP complications, and catecholamine levels normalized. The pathology and immunohistochemistry studies of the surgical specimen reported a tumor measuring 5.5×4.5×2.5 cm surrounded by a fibrous pseudocapsule and evidence of ganglion cells in the interior with positive

immunochemistry for chromogranin A, sinaptofisin, enolase and vimentin, compatible with paraganglioma (Fig. 1c–d). After this last surgery, the patient continued to be clinically asymptomatic with normal 24-h urine catecholamine.

MEN 2A is a rare disease that is associated with MTC in 100% of cases, pheochromocytoma in 50% and hyperparathyroidism in 10%–15% of cases.¹ The association of paragangliomas with MEN 2A is exceptional in the scientific literature published to date² (bibliographic search on Medline in February, 2011).

Extra-adrenal paraganglioma and pheochromocytomas are chromaffin-type tumors, 95% of which are located in the intra-abdominal area (fundamentally adrenal glands), 2%–4% in the thorax and 1% in the neck. Paragangliomas are usually located in the sympathetic chain ganglia, while extra-adrenal retroperitoneal paragangliomas have a poorer prognosis.² 20% of these paraganglioma are potentially malignant and are usually multicentric. They present a high rate of local recurrence or metastasis. This recurrence can appear years or decades after the resection of the primary tumor, and long-term follow-up is therefore necessary.³

The clinical manifestations are determined by the capacity of some paraganglioma (39%) to secrete hormones such as catecholamines, gastrin, thyrocalcitonin, ACTH, VIP and PTH, among others; arterial hypertension is the most common symptom.³ In the case that we describe, the elevated hormone and blood pressure levels led to the suspected diagnosis.

The diagnosis of pheochromocytomas and paragangliomas is based on proper anamnesis and physical examination together with the determination of plasma catecholamine and/or metanephrine levels in 24-h urine. The tumor can be located with techniques such as MIBG (which has the capability to detect tumors <0.5 cm, metastatic and multicentric tumors), CT, NMR or PET. These techniques are also used during the follow-up of these patients for the early diagnosis of possible recurrences. In the case that we present, MIBG and CT detected the existence of the tumor, while the definitive diagnosis was provided by the immunohistochemistry and histology studies.⁴

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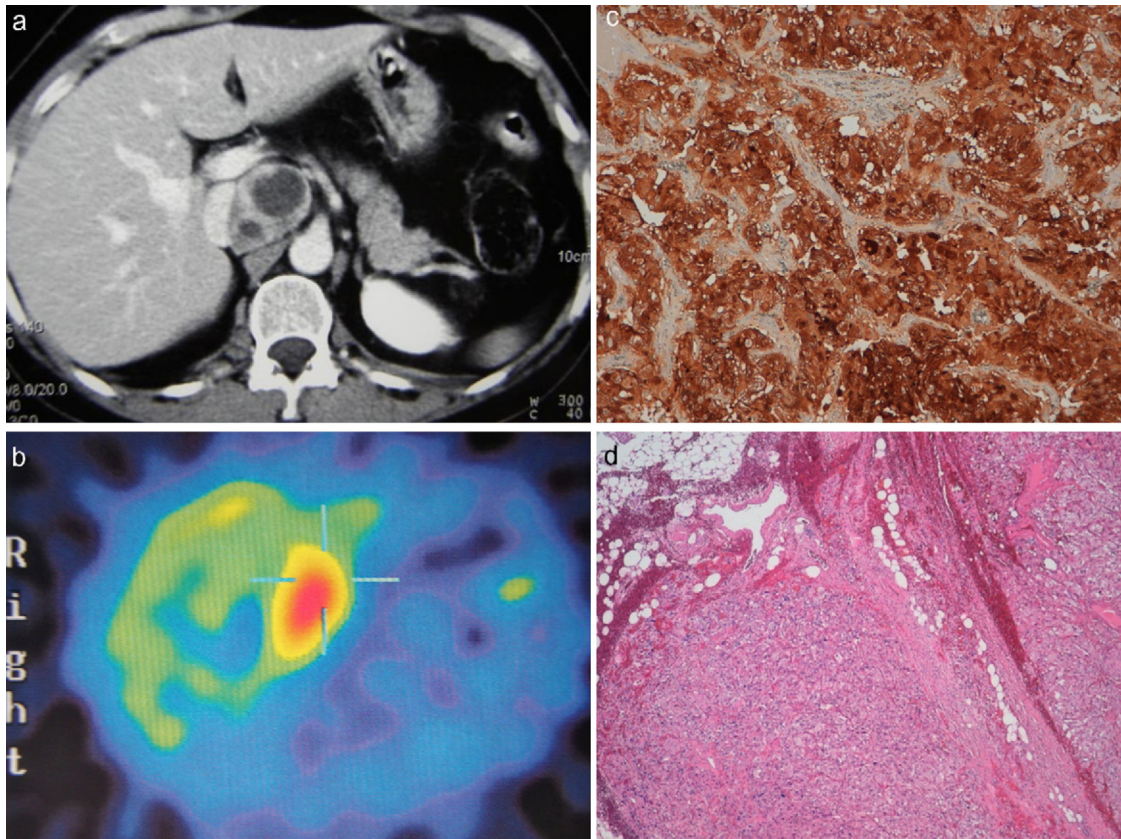


Fig. 1 – (a) Abdominal CT: mass with a hypodense center measuring 4.5 × 3 cm in the interaortocaval region, above the left renal vein and in close contact with the vena cava. (b) MIBG: increased uptake of the mass in the right suprarenal position suggestive of right pheochromocytoma or paraganglioma recurrence. (c) Immunohistochemistry: positive for chromogranin A, synaptophysin, enolase and vimentin. (d) Pathology: tumor with a surface surrounded by a fibrous pseudocapsule with evidence of ganglion cells inside.

The surgical treatment of choice for pheochromocytomas is uni- or bilateral suprarenalectomy, and the laparoscopic approach is currently a safe procedure that provides good results. In the case of paragangliomas, surgical resection is the treatment of choice, accompanied by a complete examination of the abdominal and pelvic cavities in search of other tumors. In the case of our patient, no other affected areas were found. In malignant or metastatic pheochromocytomas, treatment can be associated with MIBG- I^{131} at high doses (200 mCi), and the doses may be repeated up to a total of 800–1200 mCi. An improvement in the size of the metastasis is seen in 50%, but complete remission is reached in only 4% of cases. The use of chemotherapy and/or radiotherapy does not improve the results of surgery and are used as palliative treatment in patients with advanced disease.⁵

To conclude, we should point out that the association of paragangliomas with MEN 2 is described in the scientific literature as being unusual and may be confused with the diagnosis of pheochromocytoma or with the lack of resolution of the lesion after surgical removal, and can reappear years

later. Therefore, the long-term follow-up of these patients is essential due to the possible appearance of local recurrence, metastasis or, as in our case, associated paraganglioma. MIBG and the determination of catecholamines are the tests of choice.

REFERENCES

1. Raue F, Frank-Raue K. Genotype-phenotype relationship in multiple endocrine neoplasia type 2. Implications for clinical management. *Hormones*. 2009;8:23–8.
2. González JI, Angoso M, García JA, Clemen JJ, Ángel Prado Á, Angoso F. Feocromocitoma extraadrenal: actualización de los aspectos más controvertidos. A propósito de dos casos. *Cir Esp*. 2005;77:166–9.
3. Hartmut P, Neumann H, Eng C. The approach to the patient with paraganglioma. *J Clin Endocrinol Metab*. 2009;94:2677–83.
4. Rodríguez JM, Balsalobre M, Ponce JL, Ríos A, Torregrosa NM, Tébar J, et al. Pheochromocytoma in MEN 2A syndrome. Study of 54 patients. *World J Surgery*. 2008;32:2520–6.

5. Petri BJ, Van Eijck CHJ, Herder WW, Wagner A, De Krijger RR. Pheochromocytomas ant sympathetic paragangliomas. Systematic review. *Br J Surgery*. 2009;96:1381-92.

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Schwannoma of the Third Portion of the Duodenum: En Bloc Resection With Inclusion of the Uncinate Process of the Pancreas

Schwannoma de tercera porción duodenal: resección en bloque con inclusión del proceso uncinado del páncreas

Schwannomas are benign tumors derived from Schwann cells that represent approximately 5% of mesenchymal tumors.¹ They are most frequently found in the stomach and small intestine, and are uncommon in the duodenum. The only curative treatment is complete surgical resection.²

The patient is an 80-year-old woman with a history of arterial hypertension, diabetes mellitus, and osteoarthritis. Due to abdominal discomfort and chronic anemia, an abdominal ultrasound and a tomography were performed that identified a mid-abdominal tumor of the duodenum or uncinata process of the pancreas measuring 5 cm in diameter. The gastrointestinal tract showed a defect in the third portion of the duodenum, and upper gastrointestinal endoscopy identified a tumor that was neoplastic in appearance on the upper side of this area. It was ulcerated on the surface and caused partial stenosis of the lumen. Biopsies showed fibrinopurulent material and chronic duodenitis. Positron-emission tomography (PET) detected a mass with pathologic metabolic activity in the third portion of the duodenum (Fig. 1), with a maximum standard uptake value (SUV) of 10.4 uCi/ml. After the nuclear magnetic resonance (NMR) angiography study found no evidence of infiltration of the mesenteric-portal axis, the patient underwent surgery. Exploratory laparotomy and an extensive Kocher maneuver were performed, which were able to identify a hard, round tumor measuring 5 cm in diameter in the third portion of the duodenum that encompassed the uncinata process of

the pancreas but did not affect the superior mesenteric vessels. Cholecystectomy was performed; the transcystic approach was used for cannulation of the papilla, which was 2 cm away from the tumor. The proximal and distal duodenum areas were freed from the tumor, avoiding the right gastroepiploic and gastroduodenal arteries, and the duodenal segment and uncinata process were resected *en bloc* using Ligasure[®] and a linear endostapler (Fig. 2). The intestinal tract was reconstructed using an end-to-end anastomosis of the duodenum.

Post-op recovery was uneventful with recovery of intestinal transit and oral tolerance, and the patient was discharged on the fifth post-op day. The pathology study diagnosed a duodenal schwannoma measuring 45 mm×40 mm, with its entire capsule, low cell density, atypical nuclei, and less than 5 mitoses per 50 high-power fields. Immunohistochemistry was positive for S-100 and negative for CD117 (characteristic of GIST tumors), CD34, actin, desmin, and cytokeratins AE1 and AE3.

Schwannomas are neural tumors of ectodermal origin predominantly located in the muscle wall of the digestive tract, which develop from the Schwann cells of peripheral nerve sheaths in the Meissner and Auerbach plexuses.³ They are usually benign, although they may occasionally become malignant, and surgical resection is therefore required.

The clinical manifestations of these tumors are vague and non-specific, including abdominal discomfort, palpable mass or obstructive symptoms, or more commonly digestive bleeding, as in the case we have presented. A definitive diagnosis is sometimes difficult, as these submucosal tumors may go unnoticed with conventional endoscopy; moreover, taking biopsies from these tumors is also difficult.⁴

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