Giant abdominal tumor – would you think adrenal?

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Abstract

Adrenal cavernomas are rare benign tumors, and those of giant dimensions are exceptional. Usually, they are symptomless or they induce symptoms and signs due to compression over nearby organs. We present the case of a 68-year-old woman, who complained of abdominal enlargement and abdominal pain in the left part of the abdomen. Imagistic investigations (native and contrast abdominal computed tomography) revealed an inhomogeneous retroperitoneal mass of 210/182/200 mm, containing calcifications. Laboratory findings were not relevant, just a slight and non-significant elevation of carcinoembryonic antigen and a slight elevation of C-reactive protein. Diagnosis of cancer of undetermined origin was considered, and surgery was performed. During surgery, a giant encapsulated inhomogeneous tumor of 330 mm, with cystic areas, was removed, without assessing the origin. Primary or secondary tumors (metastasis from breast, intestinal, lung, renal or skin cancer) were taken into account. Only histopathology and immunohistochemistry revealed the diagnosis of adrenal cavernoma. Until this moment, we found only one published article in the medical literature with similar dimensions of an adrenal cavernoma as in our case. Even if rare, hemangioma of the adrenal gland must be considered during the differential diagnosis of an adrenal tumor.

Keywords: tumor, adrenal, hemangioma, giant cavernoma.

Introduction

Cavernomas are benign tumors consisting of blood vessels lined by normal endothelial cells, which can confluence and form large cystic areas or even areas of thrombosis. They can occur in any area with blood vessels, most frequently in brain, eyes, liver [1] but their occurrence in adrenal gland is rare. We have found very few (less than 100) cases of adrenal cavernoma that have been described in the medical literature since 1955, when the first case was reported by Johnson & Jeppesen. Adrenal cavernomas are rare, with an incidence of 0.01% of the adrenal tumors [2], and they infrequently reach giant dimensions. In the vast majority of cases, they measure up to 10–15 cm [3–9].

Until this moment, we found only one published article in the medical literature with similar dimensions of an adrenal cavernoma as in our case [9].

The rarity of this tumor, as well as the important problems of differential diagnosis regarding the possible malignancy, the surgical diagnostic and therapeutic difficulties make this case presentation interesting and useful to clinicians.

Case presentation

We present the case of a 68-year-old woman, who was admitted in the IInd Medical Department of Emergency County Hospital, Constanţa, Romania, in August 2018, for the evaluation of an enlargement of the abdomen and for pain, especially in the epigastric area.

Patient’s written consent to publish her medical data was obtained, as well as the approval of the Hospital Ethics Committee.

The patient had noticed progressive enlargement of the abdomen during the previous year, and, in the last two months, she had also complained of aggravated constipation.

An ultrasound (US) examination was performed before admission into the Hospital and a giant inhomogeneous, mainly hypechoic tumoral mass, with calcifications, vascularized septa and cystic areas, was described. Because the tumor occupied the entire left hemiabdomen, dimensions, origin or relations to the nearby organs were impossible to be assessed by US examination.

From her medical history, we also report type 2 diabetes mellitus (treated with oral antidiabetic drugs), stage 3...
essential hypertension (treated with diuretics), subtotal thyroidectomy (treated with 132 μg of Levothyroxine per day), osteoporosis and cholecystectomy for biliary lithiasis.

Physical examination revealed an obese patient (body mass index 35.9 kg/m²), with an enlarged abdomen and with a palpable tumoral mass in the entire left half of the abdomen, with no other pathological signs.

The performed native and contrast abdominal computed tomography (CT) indicated cortical renal cysts, with sizes up to 52/42 mm, and a macronodular, inhomogeneous, retroperitoneal mass, with the presence of infracentimetric calcifications, mainly peripheral contrast enhanced, with axial diameter of 210/182 mm and a cranio-caudal one of 200 mm, pushing rightwards the aorta and the left kidney (Figure 1).

Laboratory findings included: mild hyperglycemia, mild thrombopenia, and slight elevation of aspartate aminotransferase (ASAT), of gamma-glutamyl transpeptidase (GGT) and of C-reactive protein (CRP). As ovarian tumor was supposed, carbohydrate antigen 125 (CA 125) and carcinoembryonic antigen (CEA) were performed. Only the level of CEA was slightly and clinically non-significantly elevated (Table 1).

The patient was transferred to the IInd Surgical Department of the same Institution and surgery was performed. A large, 330 mm, encapsulated tumor, was found (Figure 2). The tumor’s origin was not clearly established during surgery.

The macroscopic description of the tumor, in the Department of Pathology was: encapsulated, grey-brown with red and yellow areas, with partial detachment of the capsule. On section, there were solid areas reported, alternating with cystic areas filled with blood. At the periphery, beneath the capsule, there were some yellow thin zones reported.

Microscopically, under the fibrous capsule, the pathologists described round to oval clusters and short trabeculae of relative small cells with pale eosinophilic cytoplasm and dark nuclei, constituting zona glomerulosa of the adrenal cortex.

Beneath these cells, the adrenal cortex was replaced by a proliferation of large, irregular, interconnected vessels, delineated by a single layer of endothelial cells. There were large areas of hemorrhagic necrosis, congestion, thrombosis and cystic degeneration, reported. Between the vessels, there were variable thickened fibrous septa, some with hyalination and focal dystrophic calcifications (Figure 3).

Immunohistochemistry (IHC) [Ventana BenchMark Gx System; ready-to-use antibodies: cluster of differentiation 34 (CD34)clone QBEnd 10 – Ventana; calretinin/clone SP65 – Ventana; melan A/clone A103 – Ventana] revealed positive CD34 reaction for endothelial cells within vascular proliferation (Figure 4) and positive adrenal cells for calretinin (Figure 5) and melan A (Figure 6).

Patient’s recovery after surgery was uneventful and she was discharged 14 days after. Abdominal US performed after six months did not reveal any pathological modifications besides the previously existing, CT revealed renal cysts (Figure 7).

![Figure 1](image1.png)  
(A and B) Native and contrast abdominal CT: macronodular retroperitoneal mass, inhomogeneous, with the presence of infracentimetric calcifications. CT: Computed tomography.

<table>
<thead>
<tr>
<th>Table 1 – Biochemical parameters</th>
<th>Value</th>
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<tbody>
<tr>
<td>White blood cells (nv: 4–10×10³/µL)</td>
<td>7.8×10³/µL</td>
</tr>
<tr>
<td>Hemoglobin (nv: 11.7–16.1 g/dL)</td>
<td>12.4 g/dL</td>
</tr>
<tr>
<td>Platelet count (nv: 150–450×10³/µL)</td>
<td>137×10³/µL</td>
</tr>
<tr>
<td>ALAT (nv: &lt;33 IU/L)</td>
<td>28 IU/L</td>
</tr>
<tr>
<td>ASAT (nv: &lt;32 IU/L)</td>
<td>40 IU/L</td>
</tr>
<tr>
<td>GGT (nv: &lt;40 IU/L)</td>
<td>91 IU/L</td>
</tr>
<tr>
<td>CRP (nv: &lt;0.5 mg/dL)</td>
<td>1.46 mg/dL</td>
</tr>
<tr>
<td>Glycemia (nv: 60–99 mg/dL)</td>
<td>118 mg/dL</td>
</tr>
<tr>
<td>CEA (nv: &lt;5 ng/mL)</td>
<td>6 ng/mL</td>
</tr>
<tr>
<td>CA 125 (nv: &lt;35 IU/mL)</td>
<td>23.3 IU/mL</td>
</tr>
</tbody>
</table>

ALAT: Alanine aminotransferase; ASAT: Aspartate aminotransferase; GGT: Gamma-glutamyl transpeptidase; CRP: C-reactive protein; CEA: Carcinoembryonic antigen; CA 125: Carbohydrate antigen 125; nv: Normal value.
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Figure 2 – (A and B) Intra-operative macroscopic aspect: encapsulated tumor of 330 mm, with red and yellow areas, with partial detachment of the capsule.

Figure 3 – Adrenal cells beneath the capsule, in zona glomerulosa of the adrenal cortex and subjacent large vascular proliferation, with thrombosis and hemorrhagic necrosis (HE staining, ×100).

Figure 4 – CD34: intense positive membrane reaction in endothelial cells; negative in adrenal cells (Anti-CD34 antibody immunomarking, ×10). CD34: Cluster of differentiation 34.

Figure 5 – Calretinin: variable positive nuclear and cytoplasmic reaction in adrenal cells; negative in vascular proliferation (Anti-calretinin antibody immunomarking, ×10).

Figure 6 – Melan A: positive reaction in the cytoplasm of the adrenal cells; negative in vascular proliferation (Anti-melan A antibody immunomarking, ×10).
Discussions

The adrenal cavernoma represents a rare non-malignant tumor, involving twice the feminine gender, usually between 50 and 70 years old. This tumor is symptomless most of the time, and is mainly diagnosed as an incidentaloma during an abdominal CT scan performed for another pathology. When cavernoma grows to giant dimensions, it can induce pain in the hypochondrium or flank, sensation of precocious satiety, impaired bowel movement due to compression and increasing abdominal pressure. Only three cases in the medical literature were described to be functional, one with glucocorticoid secretion and two with mineralocorticoid secretion [10, 11].

Discovered usually by US imaging, as an unspecific cystic tumor, generally with calcifications, more specific imaging techniques, as magnetic resonance imaging (MRI) and CT scan, are required in order to clarify the diagnosis.

MRI and contrast-enhanced CT usually reveal a peripheral spotty aspect, enhanced after contrast administration (due to the multiple peripheral cavities filled with blood), along with centripetal enhancement and with microcalcifications. The enhancement after contrast administration represents a typical feature of a hemangioma, not only in adrenals but also in other organs, too [12, 13]. Still, there are some cases in which this feature of enhancement is not present, making the diagnosis more difficult [12]. Microcalcifications are due to phleboliths’ presence.

In our case, the difficulty consisted both in removing and in specifying the origin of cavernoma, as the big dimensions of the tumor made it difficult both for the surgeon and for the pathologist. The result of the CT examination did not offer enough information in order to clarify the etiology of the tumoral mass and reported smaller sizes than the ones discovered during the surgery.

Several carcinomas (breast, lung, gastrointestinal, renal, skin) can induce metastasis in the adrenal glands. Therefore, the knowledge of the tumoral adrenal mass’s etiology is very important in the preoperative staging, if the patient is known with malignancy. Only four cases of independent adrenal hemangiomas coexisting with cancers of other organs (non-small-cell lung cancer, common bile duct cancer, breast cancer and gynecological cancer) are reported in the literature [14]. Microcalcifications revealed by CT scanning cannot differentiate between the histological types of adrenal tumors: carcinoma, tuberculosis, metastases from melanoma, hemorrhagic degeneration inside the tumor, etc. [14].

Typical immunohistochemical inspection of adrenal cavernoma is positive for CD31, CD34, and for blood coagulation factor VIII, indicating their endothelial nature [15]. In our case, the IHC was positive for CD34, and in correlation with the microscopic histopathological examination differential diagnosis with endometriosis cysts [16, 17], splenic hemangiomas, anastomosing hemangioma of the ovary [18], malignant ovarian tumors [19], multicellular cystic renal neoplasms [20], were taken into consideration. It was the positivity for calretinin and melan A that finally confirmed the adrenal origin of the cavernoma.

The treatment of adrenal incidentalomas depends on the size of the tumor, the suspicion of malignancy (based on imagistic aspect) or the functional status. In 2016, the European Society of Endocrinology, in collaboration with the European Network for the Study of Adrenal Tumors (ENSAT) published clinical practice guidelines for adrenal incidentaloma management, in which it is stipulated that open adrenalectomy must be performed for unilateral adrenal masses with radiological findings suspicious of malignancy and signs of local invasion [21].

In our case, due to the large volume of the tumoral mass, nor US, neither contrast enhanced CT scan were able to detect the adrenal origin of the tumor. Therefore, we started with the suspicion of a giant ovarian cyst. Because of this suspicion, no adrenal hormonal assessment was performed but the patient did not present the clinical aspect of any adrenal dysfunction, anyway. The final diagnosis came from the histopathological and immunohistochemical examination, the prognosis of patient’s treatment relying over that.

Conclusions

The presented case supports the first conclusion – that, even if rare, hemangioma of the adrenal gland must be considered during the differential diagnosis of an adrenal tumor. We consider this case presentation important,
first, due to its rarity (less than 100 cases reported, only one with comparable sizes). Second, this article may assist clinicians, in dealing with the problems of differential diagnosis regarding the possible malignancy, as well as in choosing the surgical solutions. Last, we stress the importance of the collaboration between clinicians and pathologists.

Conflict of interests

The authors declare that they have no conflict of interests.

Authors’ contribution

Costin Niculescu & Zizi Niculescu equally contributed to the manuscript.

References


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