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Case Report

A giant adrenocortical adenoma masquerading as retroperitoneal sarcoma: a rare diagnostic challenge

Christabel N. Gomes*, B. S. Gedam, Nitin Wasnik

Department of General Surgery, NKPSIMS and RC, Nagpur, Maharashtra, India

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***Correspondence:**
Dr. Christabel Gomes,
E-mail: christabelgomes8@gmail.com

ABSTRACT

Retroperitoneal masses often mimic malignancy due to their size and imaging features; however, large benign lesions, such as nonfunctioning adrenocortical adenomas, can present similarly. A 46-year-old woman with abdominal distension and intestinal obstruction was found to have a large heterogeneous retroperitoneal mass on imaging, provisionally diagnosed as retroperitoneal sarcoma. Surgical excision and histopathology revealed a benign adrenocortical adenoma without hormonal activity. This case highlights the diagnostic difficulty in differentiating benign from malignant retroperitoneal tumors based on imaging alone and emphasizes the importance of considering adrenal adenomas in the differential diagnosis. Histopathology and multidisciplinary care are crucial for accurate diagnosis and effective treatment planning.

Keywords: Retroperitoneal mass, Adrenal incidentaloma, Nonfunctional adrenocortical adenoma

INTRODUCTION

Retroperitoneal masses are diagnostically challenging due to varied etiologies and nonspecific presentations. They often remain silent until large enough to cause mass effect, given the retroperitoneum's expansive potential.[1,4] They are aggressive tumors with high recurrence rates. Retroperitoneal sarcomas (RPS), although uncommon, account for ~15% of soft tissue sarcomas and 0.1–0.15% of adult malignancies.[2,3] Their insidious course and vague symptoms, such as abdominal pain or distension, often delay diagnosis, and their proximity to vital organs complicates treatment.[3,4]

Adrenocortical tumors (ACTs) span from benign adenomas to carcinomas, with a slight female predilection.[4,5] Many are functional, producing hormonal syndromes like Cushing's or Conn's; however, a significant number are nonfunctional and asymptomatic.[5,6] These are usually small (<4 cm) and incidentally discovered, termed "adrenal incidentalomas".[6,7] Rarely, they present as large retroperitoneal masses, mimicking malignant lesions.

The differential diagnosis for large retroperitoneal tumors includes sarcomas, lymphomas, pheochromocytomas, and adrenal tumors. Imaging modalities such as computed tomography (CT) and magnetic resonance imaging (MRI) help assess size, location, and relationships to nearby structures but are often insufficient for definitive diagnosis.[7,8] Histopathological evaluation remains the gold standard.[9,10]

We report a case of a 46-year-old woman with a large retroperitoneal mass initially suspected to be a sarcoma. Surgical resection and histopathology later confirmed a benign adrenocortical adenoma. This case underscores the need to consider benign adrenal lesions in the differential diagnosis of large retroperitoneal masses and highlights the limitations of imaging alone in distinguishing benign from malignant tumors.[10,12]

CASE REPORT

A 46-year-old female presented with continuous, dull left lumbar pain for 5 days, along with constipation for 3 days and reduced appetite. She also reported amenorrhea for 2

months, without signs of hormonal imbalance. On examination, she was afebrile with stable vitals (pulse 98/min, BP 110/80 mmHg). Abdominal exam revealed a distended, soft, non-tender abdomen. A firm, non-tender, non-mobile mass measuring ~15×15 cm was palpable in the left hypochondrium, extending into the lumbar region.

Baseline investigations were normal: hemoglobin 11.5 g/dl, white blood cell (WBC) 7,300/mm³, platelets 339,000/mm³. Renal function (urea 10 mg/dl, creatinine 0.5 mg/dl), electrolytes, liver function, and serum proteins were within range. The coagulation profile was normal (international normalised ratio (INR) 1.16).

Abdominal ultrasound showed a large, solid, heterogeneous mass (23×13.8 cm) with internal hyperechoic areas between the spleen and left kidney, displacing the kidney medially. Doppler revealed mild vascularity. An erect abdominal X-ray indicated features suggestive of intestinal obstruction.

Contrast-enhanced CT (Figures 1a and b) revealed a well-defined, heterogeneously enhancing retroperitoneal mass measuring 16.5×13.7×20 cm in the left renal space. It extended from the left hypochondrium to the lumbar region, with multiple non-enhancing necrotic areas. Superiorly, it reached T11, displacing the pancreas, stomach, and spleen; inferiorly, it extended to L5. The mass displaced the left kidney medially and abutted the aorta and renal vessels without invading them. It pushed the descending colon and bowel loops anteriorly, and contacted the 11th and 12th ribs posteriorly. Preserved fat planes were noted throughout. Radiological impression favored retroperitoneal sarcoma (myxoid/pleomorphic).

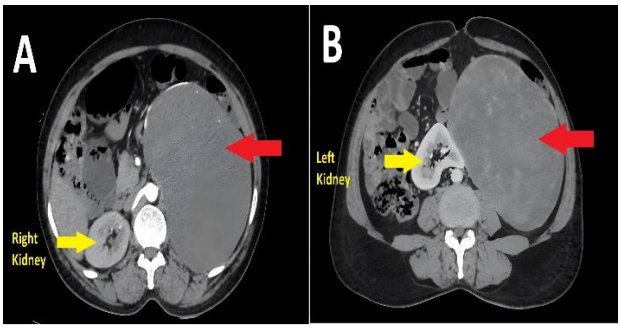

Figure 1 (A and B): CECT abdomen pelvis shows the large retroperitoneal mass.

A provisional diagnosis of retroperitoneal sarcoma was made, and the patient underwent exploratory laparotomy under general anaesthesia. Intraoperatively, a 25×20 cm encapsulated mass was found in the retroperitoneum, displacing the descending colon and left kidney anteriorly. The tumor was accessed via Toldt's line and mobilized by blunt dissection. Its feeders, arising superomedially, were carefully ligated (Figure 2a). The mass, closely associated with the left kidney, was separated from surrounding structures and excised intact (Figures 2b and 3). Hemostasis was achieved, and the abdomen was closed in layers.

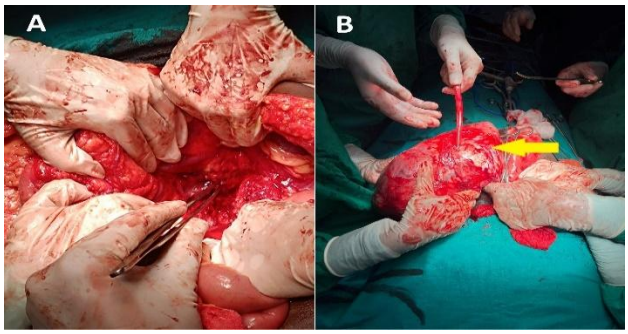

Figure 2 (A and B): Intraoperative images.

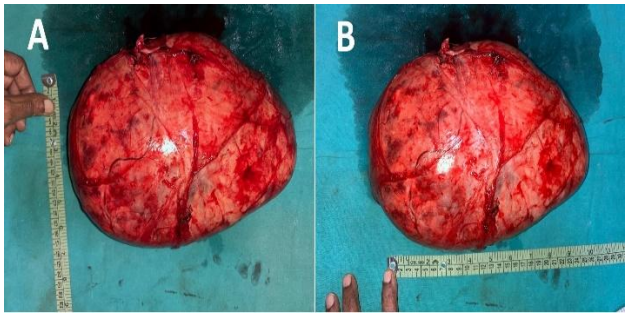

Figure 3 (A and B): Images demonstrating the dimensions of the excised tumour.

The resected mass measured 23×17×6 cm, with a weight of approximately 2.4 kgs.

The postoperative period was uneventful. Gross examination of the resected mass revealed a single well-encapsulated mass. The external surface was bosselated and had prominent vessels. On cut open, whitish with a few gelatinous and blackish areas seen (Figure 4).

Figure 4: Cut section of the resected retroperitoneal mass.

Microscopy (Figures 5a and b) showed round to polygonal cells with granular cytoplasm, vesicular nuclei, and visible nucleoli. Multinucleated forms and hemosiderin-laden macrophages were present. Rare mitoses, mild pleomorphism, and a well-vascularized stroma with thin-walled capillaries suggested a benign adrenocortical

adenoma. No malignancy or capsular/vascular invasion was noted. Immunohistochemistry confirmed the diagnosis with positivity for SF-1, Melan A, and alpha-inhibin.

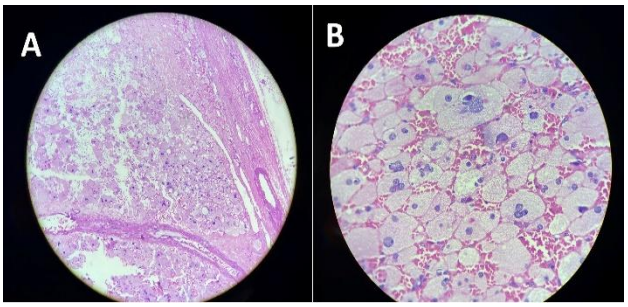

Figure 5 (A and B): Histopathological examination of the excised mass.

DISCUSSION

Unilateral adrenal tumors are frequently detected on imaging, but large adrenal tumors (LATs) are less common, occurring in 8.6% to 38.6% of adrenal lesions.[1,2] These are classified as functional or nonfunctional, and benign or malignant. Most adrenocortical tumors are benign, nonfunctioning adenomas—known as adrenal incidentalomas—typically small and asymptomatic. However, large nonfunctional adenomas, like in our case, are rare. Tumors >6 cm raise suspicion for malignancy based on size alone, posing a diagnostic challenge, particularly when presenting with symptoms suggestive of retroperitoneal malignancy.[2,5]

The retroperitoneal space houses vital organs, making it a site for both benign and malignant tumors. Retroperitoneal sarcomas (RPS), though rare, are the most common primary retroperitoneal malignancies, comprising ~0.15% of adult cancers.[3,4] They often present late due to nonspecific symptoms like pain or obstruction, as seen in our patient. Imaging is essential but limited. In this case, a large, heterogeneous mass with necrosis and preserved fat planes suggested RPS—consistent with literature reports of adrenal adenomas misdiagnosed as sarcomas due to similar imaging features.[4]

Functional adrenal tumors usually present with endocrine syndromes such as Cushing's or hyperaldosteronism.[5,6] In contrast, nonfunctional adenomas—like in our case—are often asymptomatic or cause mass effect symptoms when large. Though uncommon, our patient's presentation with abdominal pain and intestinal obstruction is consistent with reported effects of large nonfunctional adenomas. While most are discovered incidentally or due to compression symptoms, this case adds to the limited reports of nonfunctional adrenal adenomas mimicking malignant retroperitoneal tumors without biochemical abnormalities.[6,7]

Histopathology confirmed a benign adrenocortical adenoma, showing well-differentiated cells, a well-encapsulated mass, and no capsular or vascular invasion—features typical of benign adrenal tumors.[8,9] Immunohistochemistry was positive for SF-1, Melan-A, and alpha-inhibin, confirming adrenal cortical origin. In contrast, retroperitoneal sarcomas like liposarcomas and pleomorphic variants often display infiltrative growth, pleomorphism, and high mitotic activity—none of which were seen in our case. This highlights the crucial role of histopathology and immunohistochemistry when imaging findings are inconclusive.[9,10]

Large adrenal tumors (≥6 cm) are uncommon but raise concern for malignancy, with studies showing a malignancy rate of up to 31% in lesions >4 cm.[9,14] However, size alone is not a reliable predictor; imaging features and clinical context must also be evaluated. In our case, despite the tumor's large size (>20 cm), features like encapsulation and preserved fat planes suggested benignity, while necrosis and location raised suspicion for sarcoma. This underscores the risk of misdiagnosis when relying solely on size and imaging.

Management of such cases requires a multidisciplinary approach involving surgeons, radiologists, and endocrinologists. Although surgical excision is the treatment of choice for large adrenal masses, distinguishing benign from malignant lesions preoperatively is crucial to prevent mismanagement.[10,15] In our case, resection alone was curative, aligning with reports of benign adrenal masses mimicking sarcomas.[11,12,15] This reinforces that even large, non-invasive retroperitoneal tumors can be benign, emphasizing the importance of complete excision and histopathological confirmation.

Previous studies have described adrenal adenomas or ectopic adrenal rests mimicking sarcomas or liposarcomas, typically discovered incidentally or during hormonal evaluation.[12,15,16] In contrast, our case is distinct due to its symptomatic presentation with intestinal obstruction—an uncommon feature in adrenal adenomas. Despite normal biochemical workup and some benign imaging traits (encapsulation, preserved fat planes), the lesion's size and necrosis raised suspicion for malignancy. Surgical excision and histopathology confirmed a benign adrenocortical adenoma, highlighting the limitations of imaging alone. This case reinforces the importance of a broad differential diagnosis in retroperitoneal masses. While sarcomas are often suspected, rare benign adrenal tumors must be considered. Histopathological and immunohistochemical confirmation remain essential to avoid misdiagnosis and guide appropriate management.

CONCLUSION

This case highlights the diagnostic challenges of retroperitoneal masses and the critical role of histopathology and immunohistochemistry in achieving an

accurate diagnosis. While sarcomas are often suspected, benign lesions like adrenocortical adenomas can mimic their imaging features. A comprehensive approach—including imaging, biochemical evaluation, and tissue analysis—is essential to avoid misdiagnosis and ensure appropriate management.

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