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CASE REPORT

Adrenocortical Carcinoma Presenting as a Retroperitoneal Mass: Diagnostic Challenges on Core Needle Biopsy

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ABSTRACT

Adrenocortical carcinoma (ACC) is a rare and aggressive malignancy arising from the adrenal cortex, often presenting diagnostic challenges, particularly when encountered as a retroperitoneal mass with unclear adrenal origin.[4] These tumors have high prediliction for female gender.[4] We report a case of ACC presenting as a large retroperitoneal lesion, in which initial core needle biopsy posed significant diagnostic difficulty due to overlapping histomorphologic features with other retroperitoneal malignancies. Definitive diagnosis was achieved following surgical excision and comprehensive histopathological and immunohistochemical evaluation. This case highlights the limitations of core biopsy in diagnosing ACC and underscores the importance of clinicoradiologic correlation and immunohistochemistry.

KEYWORDS

• Adrenocortical carcinoma • Retroperitoneal mass • Core needle biopsy • Histopathology • Immunohistochemistry

INTRODUCTION

Adrenocortical carcinoma is a rare endocrine malignancy with an incidence of approximately 1–2 cases per million population per year. It commonly presents as a large adrenal mass and may be functional or non-functional. When ACC presents as a retroperitoneal lesion without clear radiologic evidence of adrenal origin, diagnosis becomes challenging. Core needle biopsy specimens may be limited and morphologically overlapping with other high-grade retroperitoneal tumors such as renal cell carcinoma, sarcoma, neuroendocrine tumors, and metastatic malignancies. We present a case illustrating these diagnostic pitfalls.

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Case Presentation

A 32 **year-old male** patient presented with **abdominal fullness since 6 months and pain since 7 days. No history of fever.** There were no overt clinical features of hormonal excess

Contrast-enhanced computed tomography (CT) of the abdomen revealed a **large heterogeneously enhancing retroperitoneal mass** measuring **11 × 9 × 9 cm**,with punctate peripheral calcification in left retroperitoneum from L1-L4 level,replacing spleen, left kidney, pancreas and stomach. A CT-guided core needle biopsy was performed for tissue diagnosis.

Histopathological Findings

Core Needle Biopsy

Microscopic examination of the core biopsy showed fragments of a **cellular neoplasm** composed of sheets of **large polygonal cells** with abundant **eosinophilic cytoplasm**. Few of the nuclei were enlarged, irregular, and showed hyperchromasia. Given with limited tissue possibility of rhabdoid neoplasm was given.

Initial immunohistochemical studies demonstrated **Pan CK, Melan A and Inhibin positivity**, with negative staining for **CK7, CK20, PAX8, chromogranin**, myogenin rendering the diagnostic possibility of adrenocortical neoplasm.Then the patient was evaluated thoroughly for biochemical parameters like serum cortisol, Dehydroepiandrosterone Sulfate (DHEA-S) levels which were in normal limits.

Surgical Resection Specimen

The patient subsequently underwent **surgical excision / adrenalectomy**. Gross examination revealed a single grey brown to dark brown globular mass measuring 12 x 11 x 8cm. External surface: capsulated, glistening, soft to firm in consistency. Cut section: noted grey white to yellow solid areas with areas of hemorrhage.

Microscopic examination revealed a capsulated tumor. Tumor cells were discohesive and are round to oval in shape with abundant eosinophilic graular cytoplasm and vesicular nuclei. Also noted few cells with bizzarre nucleus and prominent nucleoli. Mitosis 6-8 /50hpf noted.

Areas of hemorrhage and necrosis seen. Venous invasion identified. There was no evidence of capsular breach. Compressed adrenal tissue noted.

Based on the **Weiss criteria**, the tumor fulfilled multiple malignant features.[1]

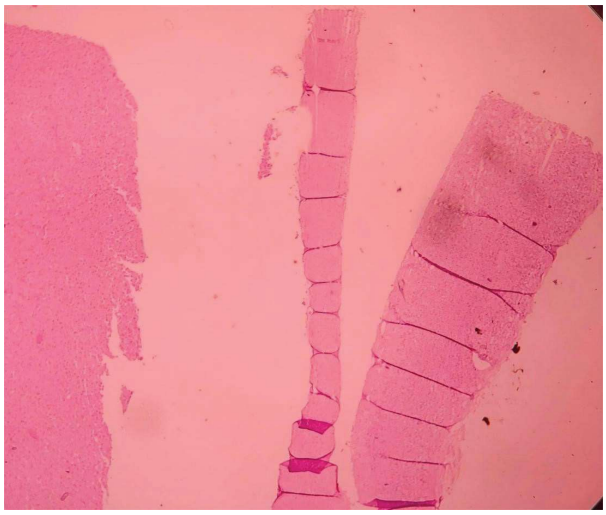
Immunohistochemistry performed on resected specimen and showed positivity for Inhibin, Melan A and synaptophysin.The immunoprofile confirmed the diagnosis of **adrenocortical carcinoma**.However SF1 was not available and could not be performed in our institution.

DISCUSSION

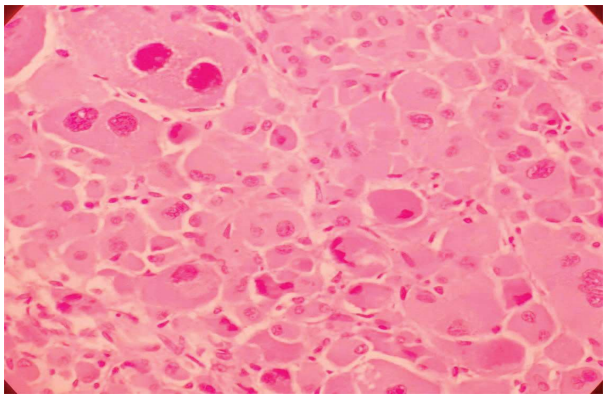
ACC is notorious for its histologic heterogeneity and overlap with other retroperitoneal malignancies. In small biopsy samples, classic architectural features may not be evident, and immunohistochemical panels may be limited, leading to diagnostic uncertainty.

Core needle biopsy, while useful in excluding metastatic disease, may be insufficient for definitive diagnosis of ACC due to sampling error and overlapping morphology. Markers such as **SF-1** are highly sensitive and specific for adrenocortical origin and should be included when ACC is suspected[3].

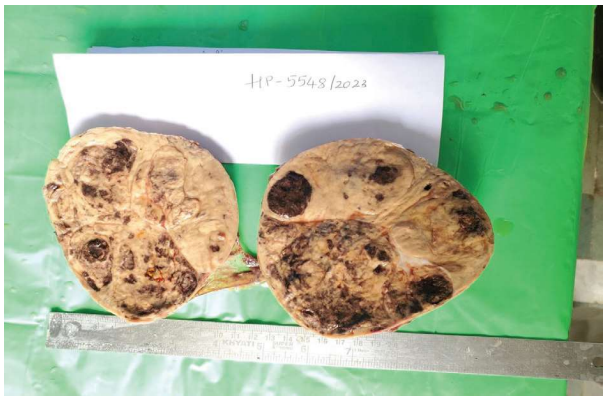
This case emphasizes the importance of integrating **radiologic findings, clinical context, and expanded immunohistochemistry**, and cautions against over-reliance on core biopsy alone.



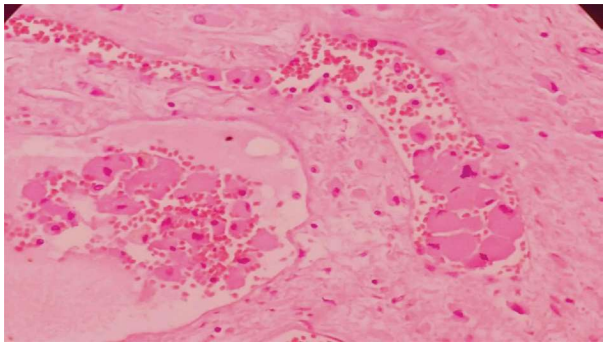
H and E(10x) section of core biopsy showing sheets of polygonal cells



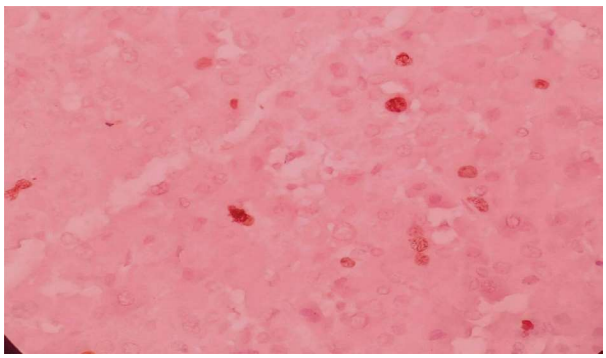
H and E(40x) shows same cells with abundant eosinophilic granular cytoplasm with pleomorphic nuclei.



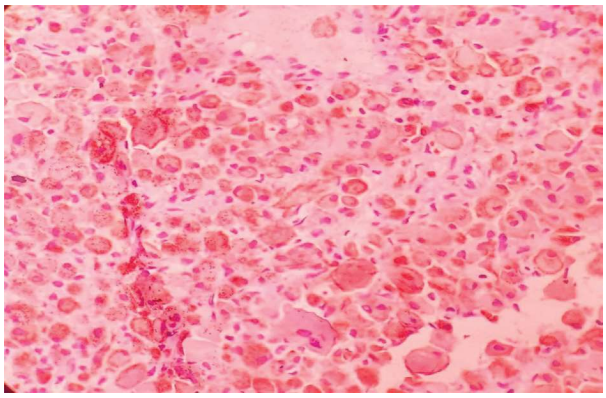
Gross specimen showing capsulated lesion with areas of hemorrhage and necrosis.



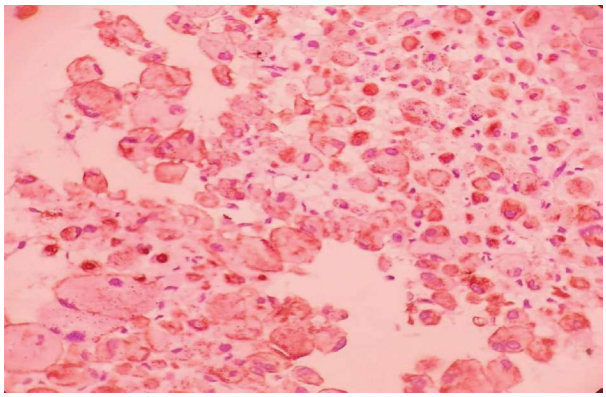
H and E (40x) section from resected specimen showing venous emboli



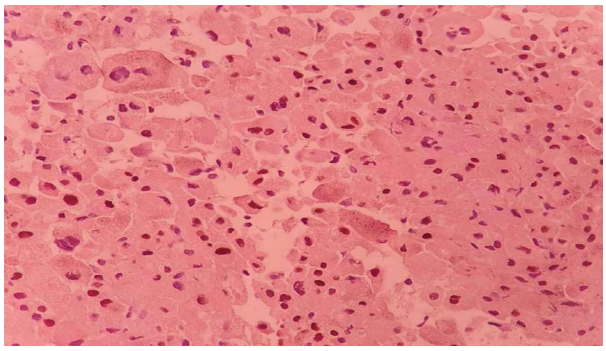
IHC PanCK 40x showing negative staining



IHC (40x) Melan A showing positivityin neoplastic cells.



IHC(40x) showing Inhibin positivity in neoplastic cells



IHC(40x) Ki67 showing High proliferative index

CONCLUSION

Adrenocortical carcinoma can present as a retroperitoneal mass with ambiguous features on core needle biopsy. Awareness of its histopathologic spectrum and judicious use of immunohistochemical markers are essential to avoid misdiagnosis. Surgical excision remains critical for definitive diagnosis and management.

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