International Surgery Journal
Bansod AN et al. Int Surg J. 2025 May;12(5):835-838
http://www.ijsurgery.com
pISSN 2349-3305 | eISSN 2349-2902

DOI: https://dx.doi.org/10.18203/2349-2902.isj20251188

Case Report

A rare case of giant adrenocortical carcinoma: a case report

Atish N. Bansod*, Mauktik Satpudke, Yusuf Hakim, Niteen Sawase, Aryant Pratap Singh, Yugal Nande

Department of General Surgery, IGGMC, Nagpur, Maharashtra, India

Received: 02 March 2025
Revised: 19 March 2025
Accepted: 25 March 2025

***Correspondence:**
Dr. Atish N. Bansod,
E-mail: atish6267@gmail.com

ABSTRACT

Adrenocortical tumors are rare, and when large, they are often referred to as incidentalomas if detected during evaluation for unrelated symptoms. These tumors may be nonfunctional or have subtle clinical presentations, posing diagnostic and management challenges. A 50-year-old male presented with a seven-day history of dull, aching pain in the right hypochondrium, associated with a sensation of fullness in the right upper abdomen. Physical examination revealed a palpable mass in the right hypochondrium. Based on clinical evaluation, mass was suspected to be an adrenocortical malignancy. Contrast-enhanced computed tomography (CECT) identified a well-circumscribed, heterogeneous mass measuring 11×9×10 cm arising from the right adrenal gland. Hormonal workup demonstrated no functional activity, and the mass was considered an incidentaloma. The patient underwent open surgical excision of the tumor. Intraoperative findings revealed a well-encapsulated mass with no invasion of surrounding structures. Histopathological evaluation confirmed an adrenocortical carcinoma (Weiss score >3). Postoperative recovery was uneventful, and follow-up imaging at six months showed no signs of recurrence or metastasis. This case highlights the importance of evaluating incidentalomas, particularly large adrenal masses, for their potential clinical significance. Timely surgical intervention and histopathological confirmation are essential for ensuring favourable outcomes in such cases.

Keywords: Adrenocortical carcinoma, Right hypochondrium pain, Incidentalomas

INTRODUCTION

Adrenocortical carcinoma (ACC) is a rare and often aggressive malignancy, with an estimated global incidence of approximately 2 cases per million people annually. It has been observed more frequently in women than in men. The prognosis varies significantly, with a 5-year survival rate ranging from 15% to 84%, depending on the stage of the disease at diagnosis.[1,2]

ACC is classified into two types functioning tumors, which produce hormones, and non-functioning tumors, which do not. The clinical presentation is influenced by the tumor's size, location, and hormonal activity. Larger tumors may cause abdominal pain and discomfort due to mass effect, while systemic symptoms such as weight loss, fatigue, and breathing difficulties may also occur.[3,4] Surgical resection remains the primary treatment and offers the best chance for improved survival, particularly when complete removal of the tumor and involved structures is achieved. In some cases, adjuvant therapy with mitotane and cytotoxic agents is recommended, particularly for hormone-secreting tumors or advanced disease stages.[5,6] This study presents a case of a patient diagnosed with ACC after presenting with a large abdominal mass, who subsequently underwent radical surgical resection.

CASE REPORT

A 50-year-old male presented to the outpatient department at Indira Gandhi Government Medical

College, Nagpur, with complaints of dull, aching pain localized to the right hypochondrium for the past seven days. The pain was non-radiating, mild to moderate in intensity, and associated with a sensation of fullness in the right upper abdomen. The patient denied any history of nausea, vomiting, fever, weight loss, or changes in bowel or urinary habits. There was no prior history of hypertension, diabetes mellitus, or any known endocrinological or oncological conditions.

On physical examination, the abdomen was soft with a palpable, firm, non-tender mass in the right hypochondrium. There were no signs of peritonitis or abdominal distension. Vital signs were stable, and there was no evidence of skin pigmentation, striae, or other stigmata suggestive of endocrine overactivity. The patient underwent a detailed biochemical evaluation. Plasma free metanephrines were measured to rule out pheochromocytoma, yielding a result of 169 pg/m, within the normal range (<205 pg/ml). Other hormonal assays, including serum cortisol, 24-hour urinary catecholamines, aldosterone-renin ratio, and dehydroepiandrosterone sulphate (DHEA-S), were within normal limits, indicating a nonfunctional adrenal mass.[7]

Contrast-enhanced computed tomography (CECT) of the abdomen revealed a large, well-circumscribed mass measuring 11×9×10 cm originating from the right adrenal gland. The lesion had a central non-enhancing necrotic area, surrounded by a heterogeneous but predominantly solid enhancing component.[8] Importantly, fat planes were maintained all around the mass, and there was no evidence of invasion into surrounding structures, lymphadenopathy, or distant metastasis.

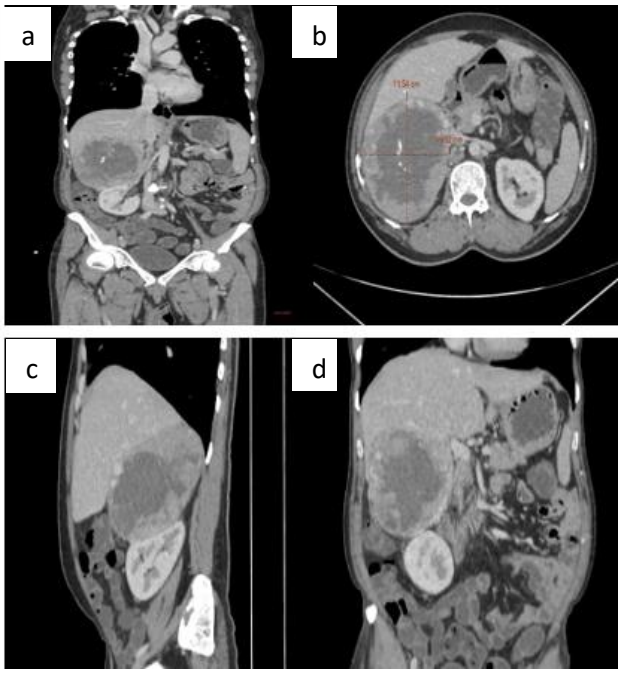

Figure 1 (a-d): CT images showing right sided adrenocortical mass.

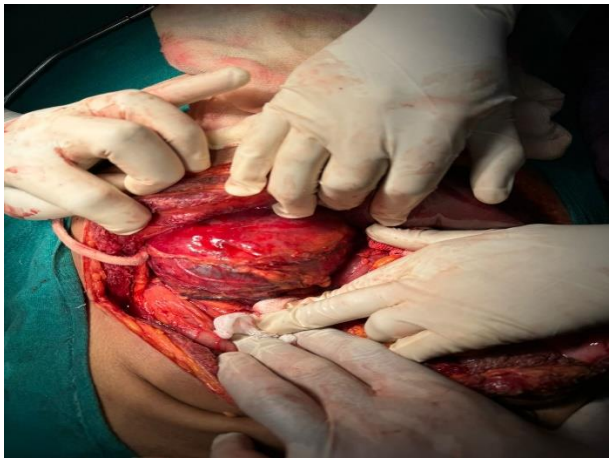

Figure 2: Intraoperative image showing large right sided adrenocortical mass.

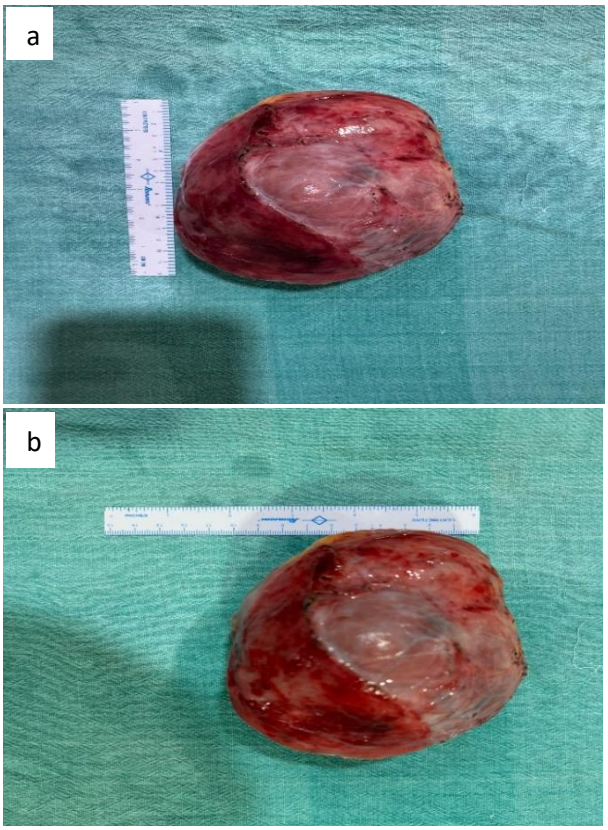

Figure 3 (a, b): Resected adrenal mass.

Given the size of the tumor and its potential for malignancy, the patient was planned for surgical resection. An open adrenalectomy was performed through a right subcostal incision. Intraoperatively, the mass was well encapsulated and easily separable from adjacent structures. The surgical excision was completed without complications, and the resected specimen was sent for histopathological examination.

The patient's postoperative course was uneventful. He was mobilized on the first postoperative day and

discharged on the fifth postoperative day. At follow-up, the patient reported no symptoms, and repeat imaging at six months confirmed no evidence of recurrence or metastasis.[9]

Histopathology

Macroscopic examination revealed a 620-gram encapsulated tumor with a variegated appearance, including solid and cystic areas. Microscopic analysis confirmed an adrenocortical carcinoma (Weiss score -9). Margins were free of tumor infiltration.[10]

DISCUSSION

Adrenocortical tumors (ACTs) are rare neoplasms, with a reported prevalence of approximately 0.1% in imaging studies conducted for unrelated reasons.[11] Tumors larger than 4 cm are particularly significant because they are associated with an increased risk of malignancy and warrant surgical exploration.12 This case involves a giant adrenocortical tumor (11×9×10 cm) presenting as an adrenal incidentaloma in a 50-year-old male, highlighting key aspects of diagnosis, management, and follow-up.

Incidentalomas and diagnostic challenges

Adrenal incidentalomas are masses detected during imaging for unrelated symptoms, and their management hinges on determining functionality and malignancy potential. In this case, the tumor was detected during evaluation of dull, aching pain in the right hypochondrium, a nonspecific symptom that may reflect mass effect or incidental discovery.

Functional assessment is crucial, as hormonally active tumors such as pheochromocytomas, aldosterone-producing adenomas, or cortisol-secreting tumors demand tailored preoperative management.

Biochemical evaluation in this patient revealed plasma metanephrines within the normal range (169 pg/ml), ruling out pheochromocytoma. Additionally, serum cortisol, DHEA-S, and aldosterone-renin ratio were normal, indicating the tumor was nonfunctional. This aligns with findings in the majority of adrenal incidentalomas, which are nonfunctional in approximately 85% of cases.

Imaging features

CECT is essential in adrenal mass characterization. In this patient, the tumor exhibited classical features of a large, heterogeneous, well-circumscribed adrenal mass with a central non-enhancing necrotic area and intact fat planes, suggesting a low likelihood of local invasion or metastatic spread. While imaging characteristics are not definitive for differentiating benign from malignant tumors, the absence of local invasion and preserved fat planes strongly supported a diagnosis of low-grade or benign ACT.

Surgical management

Surgical excision is the treatment of choice for large adrenal masses (>4 cm), irrespective of functionality, due to the risk of malignancy. In this case, an open adrenalectomy was performed, which is preferred for larger tumors or when malignancy cannot be excluded preoperatively. The intraoperative findings of a well-encapsulated mass with no local invasion corroborated the imaging findings. Complete resection not only allows for definitive histopathological diagnosis but also mitigates the risk of potential malignancy or functional complications.

Histopathology and malignancy risk

Histopathological examination remains the gold standard for diagnosing and grading ACTs. The Weiss scoring system is widely used to assess the malignant potential of adrenocortical tumors, with scores ≥3 indicative of malignancy.

In this case, the tumor was confirmed as an adrenocortical carcinoma with a Weiss score of 9 which was non-invasive and non-functional in nature. Tumor necrosis, a feature observed in this patient, can occur in both benign and malignant adrenal masses.

Postoperative course and follow-up

The postoperative course in this patient was uneventful, reflecting the effectiveness of surgical management. Long-term follow-up is critical for detecting recurrence or metastasis, particularly in large tumors, as they carry a slightly increased risk compared to smaller masses. In this patient, follow-up at six months showed no evidence of recurrence or metastasis. For low-grade ACTs, imaging and clinical follow-up are generally recommended at intervals of 6-12 months for at least two years.[13]

Implications and lessons learned

This case underscores several important aspects of managing adrenal incidentalomas.

Systematic evaluation

A structured approach involving biochemical tests and imaging is essential to determine the functional status and malignant potential of adrenal masses.

Role of surgery

For large, nonfunctional adrenal tumors, surgical resection remains the cornerstone of management, even in the absence of definitive signs of malignancy.

Multidisciplinary approach

Collaboration among endocrinologists, radiologists, pathologists, and surgeons ensures optimal outcomes.

Importance of follow-up

Postoperative surveillance is crucial to identify late recurrences or metastases, particularly for tumors at the higher end of the benign spectrum.

CONCLUSION

This case highlights the incidental detection and management of a giant, nonfunctional adrenocortical tumor presenting with nonspecific abdominal symptoms. Although rare, adrenocortical carcinoma should be considered in cases of a right upper quadrant abdominal mass. Timely evaluation and surgical intervention ensured a favourable outcome.14 The case reinforces the need for a multidisciplinary approach and vigilant follow-up to optimize patient care in similar scenarios.

Novel contributions of this case

While giant adrenocortical tumors are described in the literature, this case emphasizes. The incidental detection of a large, nonfunctional tumor in a patient with acute, nonspecific symptoms. Successful management with open adrenalectomy and histopathological confirmation of low-grade ACT. Favourable postoperative outcomes, reinforcing the importance of early surgical intervention and structured follow-up.

Funding: No funding sources
Conflict of interest: None declared
Ethical approval: Not required

REFERENCES

1. Fassnacht M, Kroiss M, Allolio B. Update in adrenocortical carcinoma. J Clin Endocrinol Metab. 2013;98(12):4551-64.
2. Else T, Kim AC, Sabolch A. Adrenocortical carcinoma. Endocr Rev. 2014;35(2):282-326.
3. Libé R. Adrenocortical carcinoma (ACC): diagnosis, prognosis, and treatment. Front Cell Dev Biol. 2015;3:45.
4. Berruti A, Baudin E, Gelderblom H. Adrenal cancer: ESMO clinical practice guidelines for diagnosis, treatment, and follow-up. Ann Oncol. 2012;23(7):131-8.
5. Terzolo M, Angeli A, Fassnacht M. Adjuvant mitotane treatment for adrenocortical carcinoma. N Engl J Med. 2007;356(23):2372-80.
6. Fassnacht M, Terzolo M, Allolio B. Combination chemotherapy in advanced adrenocortical carcinoma. N Engl J Med. 2012;366(23):2189-97.
7. Young WF. The incidentally discovered adrenal mass. N Engl J Med. 2007;356(6):601-10.
8. Sturgeon C, Shen WT, Clark OH. Risk assessment in adrenal incidentalomas: lessons from 131 cases. J Clin Endocrinol Metab. 2005;90(7):4172-7.
9. Brix D, Allolio B, Fenske W. Long-term prognosis of patients with adrenal incidentalomas. Horm Metab Res. 2015;47(3):224-9.
10. Weiss LM. Comparative histologic study of 43 metastasizing and nonmetastasizing adrenocortical tumors. Am J Surg Pathol. 1984;8(3):163-9.
11. Mansmann G, Lau J, Balk E. The clinically inapparent adrenal mass: update in diagnosis and management. Endocr Rev. 2004;25(2):309-40.
12. Barzon L, Sonino N, Fallo F, et al. Prevalence and natural history of adrenal incidentalomas. Eur J Endocrinol. 2003;149(4):273-85.
13. Assié G, Letouze E, Fassnacht M. Integrated genomic characterization of adrenocortical carcinoma. Nat Genet. 2014;46(6):607-12.
14. Kebebew E, Reiff E, Duh QY. Adrenal incidentaloma: effect of hormonal functional status and biopsy on management. Ann Surg. 2006;244(4):524-30.

Cite this article as: Bansod AN, Satpudke M, Hakim Y, Sawase N, Singh AP, Nande Y. A rare case of giant adrenocortical carcinoma: a case report. Int Surg J 2025;12:835-8.