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Challenges in diagnosis and management of a giant non-functioning adrenocortical carcinoma: A case report

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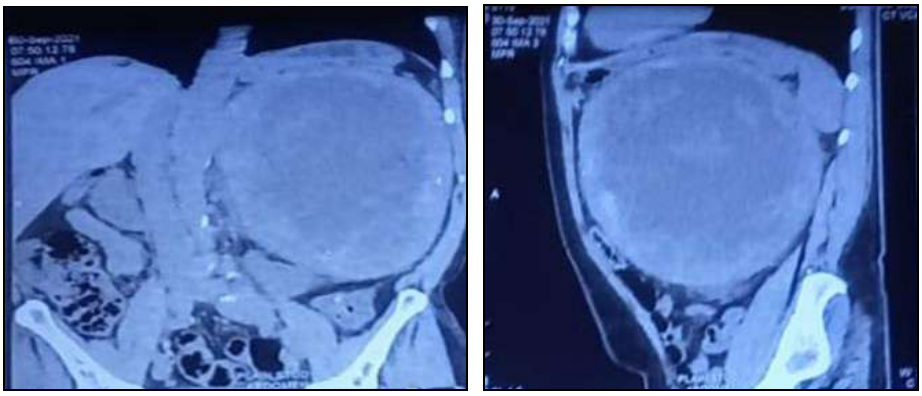
Abstract
Adrenocortical carcinoma (ACC) despite being a rare endocrine malignancy arising from adrenal cortex carries a poor prognosis. It is also challenging to diagnose these tumours preoperatively especially if it is a non-functioning tumour. As the rarity of the disease pose a great challenge in taking up statistically significant studies that would be needed to improve the management strategies and outcomes of ACC, all the recommendations are based on retrospective case series or expert opinions. Hence Multidisciplinary approach is warranted to improve the outcomes in the management of ACC. Despite the enormous progress achieved in the biological knowledge of this tumor, the ACC remains an oncological disease burdened by a high mortality. Surgery is still the first therapeutic option and the only potentially curative treatment.

Keywords: Adrenocortical carcinoma, diagnosis and management, non-functioning

Introduction
Adrenocortical carcinoma (ACC) is a rare endocrine malignancy arising from the adrenal cortex often with unexpected biological behaviorur with an annual incidence of 1-2 new cases per million people in a year [1]. It is the second most aggressive endocrine malignancy after anaplastic thyroid carcinoma. The rarity of the disease and its dismal prognosis calls for a multidisciplinary approach to improve the outcomes. The age distribution is bimodal with peaks occurring at 5 to 20 and 40 to 50 years of age and it is shown to exhibit a slight female predominance [1]. Preoperative diagnosis of malignant ACC (Adriano Cortical Carcinoma) is not ever clear due to the increasing incidence of benign adrenal lesions and incidentalomas. By their ability to produce hormones, they can be functioning ACC and non-functioning ACC. Non-functioning ACC is associated with a poorer prognosis mainly due to delay in diagnosis and many patients present at advanced stages as they don't present with typical symptoms like Cushing's syndrome, virilisation, feminization as in functioning ACC [2]. Radical surgical resection, avoiding tumor rupture, remains the mainstay of therapy and the most important prognostic factor. Recurrences, both local and metastatic, are reported in up to 85% of patients after resection, and overall the prognosis remains poor, with a 5-year survival rate of 16% to 47% [2]. As the rarity of the disease pose a great challenge in taking up statistically significant studies that would be needed to improve the management strategies and outcomes of ACC, all the recommendations are based on retrospective case series or expert opinions. Here we report a peculiar case of a 62 years old male with a giant ACC that we operated with excellent results to emphasize the existing issues on differential diagnosis and management of ACC.

Case report
A 62 years old male presented with complaints of vague, dull aching abdominal pain localized to the epigastria, left lumbar and left hypochondriac regions with no complaints of nausea, vomiting, haematuria or significant weight loss, a known hypertensive on tablet enalapril. He had no other remarkable medical or surgical history. He didn't smoke tobacco and consume alcohol. He was afebrile at the time of admission. On physical examination, the abdomen was soft with minimal tenderness over the left flank and a palpable mass occupying the left quadrants was felt. Rest of the clinical examination was normal. His blood pressure was 138/84 mmHg, his pulses were regular at 76-88 beats/minute, and his temperature was 36.5 °C.

Laboratory testing of complete blood count, platelets, renal function tests, liver function tests were normal. On tablet enalapril. He had no other remarkable medical or surgical history. He didn't smoke tobacco and consume alcohol. He was afebrile at the time of admission. On physical examination, the abdomen was soft with minimal tenderness over the left flank and a palpable mass occupying the left quadrants was felt. Rest of the clinical examination was normal. His blood pressure was 138/84 mmHg, his pulses were regular at 76–88 beats/minute, and his temperature was 36.5 °C. Laboratory testing of complete blood count, platelets, renal function tests, liver function tests were normal. A contrast enhanced computed tomography (CECT) of the abdomen (Fig 1a &1b) showed a large mass of size 20*18*17 cm in left retro peritoneal space pushing the bowel loops away and left renal vessels anteriorly. The origin of the mass was not clear and we proceeded with CT guided biopsy of the mass which reported to be either renal cell neoplasm or adrenocortical neoplasm. A functional adrenal workup including serum aldosterone, potassium, renin, and adrenocorticotrophic hormone levels and measurement of 24-hour urinary metanephrine levels was performed. All results were within the reference ranges. CT scan of his chest and head were negative for metastasis. Considering the risk of malignancy in ttumors of size > 6cm to be 25% compared to 2% of those with a size < 4cm and symptoms to due mass effect after Multidisciplinary team discussion decision was made to proceed with en-bloc excision of the mass.

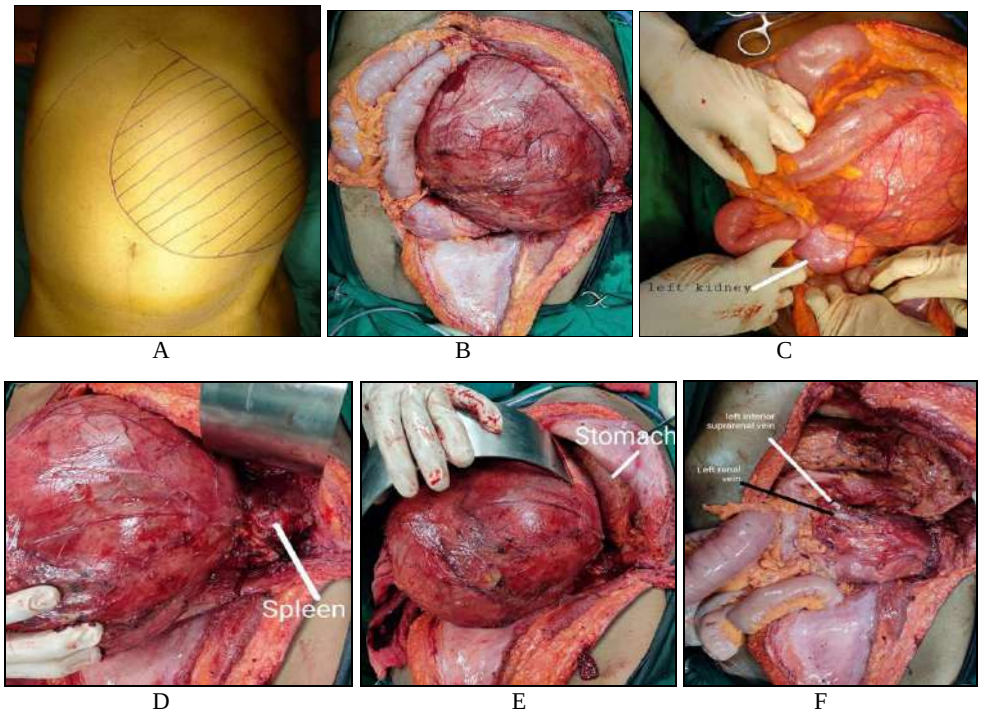


a **b**

Fig 1a, b: CECT abdomen showing a large retroperitoneal mass pushing left kidney medially

Operative findings

Under General anaesthesia, standard midline laparotomy done. The mass was exposed completely after medial reflection of the descending colon and was displacing stomach super laterally, spleen laterally and left kidney medially (Fig 2a-f), with no evidence of adjacent organ invasion. Aorta & Inferior Vena Cava was free. Tumour resected without breaching the capsule. No enlarged lymph nodes were identified. Aadequate hemostasis secured and an intra-abdominal drain was inserted. Ppostoperative recovery was uneventful. The drain was removed on postoperative day 2, and the patient was discharged on postoperative day 6. He was followed up 8 weeks postoperatively with no complications.



A B C

D E F

Fig 2a-f: Intraoperative images showing planning of incision, exposing the mass and resection after ligating left inferior suprarenal vein

Histological findings

Gross examination showed a 1.6 kg encapsulated soft tissue mass measuring 26*24*12cm along with a residual adrenal gland measuring 1*1*0.5cm. Cut surface showed variegated multiloculated solid and cystic greyish brown tumour with solid, haemorrhagic, necrotic and myxoid areas. Histological examination showed compressed adrenal parenchyma with an adjoining well encapsulated neoplasm composed of extensive necrosis intervened by broad fibrous spate and focal areas of degenerated clear cells. As multiple sections couldn't yield viable tissue, mitosis, nuclear grade, capsular invasion, vascular invasion and IHC antigenicity couldn't be detected.

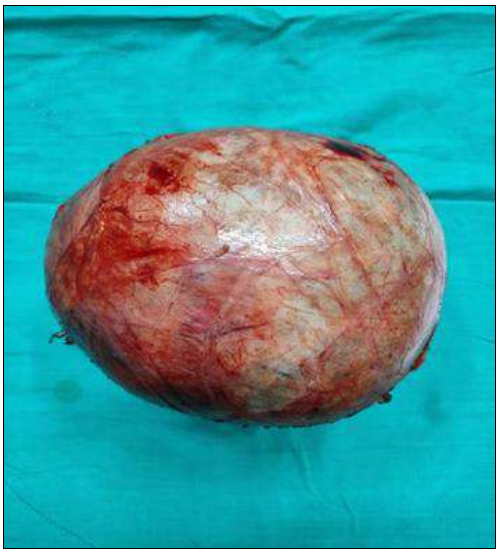


Fig 3: Gross specimen of ACC with intact capsule

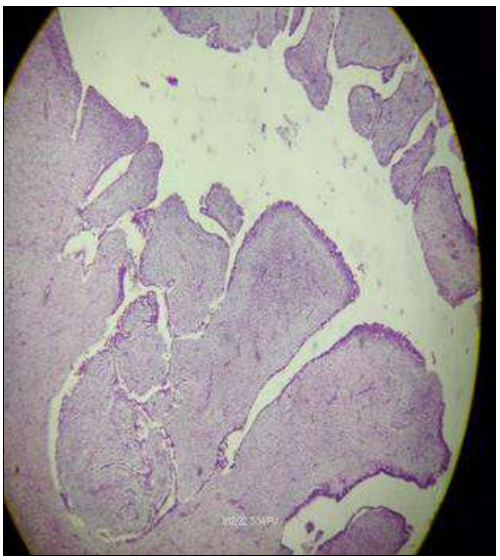


Fig 4: Microscopic examination showing fibrous septae with focal degenerated cells

Discussion

As described in the literature 60% of patients with ACC present with symptoms and signs of hormonal secretion usually that of combined glucocorticoid and androgen secretion. So, the workup for adrenal masses must include determination of whether the mass is functioning or non-functioning [3, 4]. For all adrenal masses, diagnosis of pheochromocytoma should be excluded by measuring plasma-free or urinary-fractionated metanephrines to avoid intra operative complications.

Nearly 30-40% of patients with primary ACC present with a mass-related syndrome as abdominal or dorsal pain, a palpable mass, fever of unknown origin, signs of Iinferior Vena Cava (IVC) compression, and signs of left-sided portal hypertension.

Computerized Tomography (CT) imaging of the adrenals is the major tool showing a unilateral non- homogeneous mass, > 5cm in diameter, with irregular margins, necrosis, and occasionally calcifications. With the presence of large tumor of >4 cm, the clinical suspicion of malignancy was high [6, 7]. On Magnetic Resonance Imaging (MRI), ACC appears hypo or is intense in relation to the liver on T1-weighted images. Emerging evidence suggests that fluorodeoxyglucose positron emission tomography (FDG-PET) with CT is superior to CT alone. However, FDG-PET/CT is still considered a complementary study and is not recommended for ACC work-up [5].

But the crux lies in diagnosing and managing non-functioning ACC especially when it is a huge tumour where the tumour tend to outgrow its vascular supply and go for necrosis posing a difficulty in diagnosis by imaging and preoperative histopathology.

In such cases, where strong suspicion of malignancy exists based on size of the tumour, presence of extensive necrosis, deciding on management requires a multidisciplinary approach.

ACC in the past was considered an orphan disease for which surgery represented the only feasible therapy. Over the years the focus on this aggressive endocrine malignancy has gradually grown, capturing the interest of many investigators. Despite the enormous progress achieved in the biological knowledge of this tumor, the ACC remains an oncological disease burdened by a high mortality. Surgery is still the first therapeutic option and the only potentially curative treatment.

Although lymphadenectomy has never been considered as a standard procedure in the adrenalectomy, recent studies show that lymph nodes dissection is significantly associated with a reduction of the relapse rate in patients with localized disease [8, 9]. However, no confirmatory data exists to standardize the surgical procedure. Bulking surgery to reduce either the compressive effect exerted by a large size mass, on surrounding organs or the hormonal excess secreted by the tumor, is an oncological rationale [10]

In cases of recurrence, surgery should be considered a first-line option. However, mitotane has a valuable role in stage IV cases or in the presence of recurrent disseminated disease [11, 12]. A recent study showed that blood mitotane concentrations ≥14 mg/l were associated with a prolonged recurrence-free survival (RFS) in patients following macroscopically radical surgery [13].

Conclusion

ACC is a rare and aggressive malignancy. Non-secretory adrenal masses are diagnosed late by a mass effect, metastatic disease, or found incidentally. Open surgery represents the first therapeutic choice in ACC.

Despite many recent progress being achieved in this field, the prognosis of this cancer remains the same. Beyond

surgery, that is considered the standard of care, current therapeutic options include mitotane in adjuvant therapy and the use of different chemotherapeutic agents in combination, among which EDP plus mitotane is the Prevailing combination, in the treatment of advanced ACC. There is no established duration of adjuvant chemotherapy. High-risk patients are currently being treated for 5 years with mitotane.

Postoperative surveillance for recurrence should be performed every 3 months for the first 2 years and then every 6 months for 5 years. Contrast-enhanced CT scans of the chest, abdomen, and pelvis are the standard of care for follow-up; however, FDG-PET/CT scans are used in some specialized centers and are still under investigation.

Future efforts should be made not only to explore new frontiers but also to investigate on.

1. Optimal surgical techniques and procedural strategies.
2. To validate mitotane use in the adjuvant setting.
3. To evaluate post-surgery radiotherapy effectiveness in this rare but highly aggressive endocrine malignancy.

Acknowledgement

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Conflicts of interests

We declare that there are no conflicts of interest.

References

1. Norton JA. Adrenal tumors. In Cancer: Principles and Practice of Oncology. 7th edition. Edited by DeVita VT Jr, Hellman S, Rosenberg SA. Philadelphia, PA: Lippincott Williams Wilkins; c2005. p. 1528-1539.
2. Vassilopoulou-Sellin R, Schultz PN. Adrenocortical carcinoma. Clinical outcome at the end of the 20th century. Cancer. 2001;92:1113.
3. Almarzouq A, Asfar S, Hussain S, Al-Hunayan A, Aldousari S. Giant nonfunctioning adrenocortical carcinoma: a case report and review of the literature. BMC Res Notes. 2014;31:7.
4. Wilkinson M, Fanning DM, Moloney J, Flood H. Giant adrenal pseudo cyst harboring adrenocortical cancer. BMJ Case Rep; c2011. DOI: 10.1136/bcr.05.2011.4169.
5. Deandreis D, Leboulleux S, Caramella C, Schlumberger M, Baudin E. FDGPET in the management of patients with adrenal masses and adrenocortical carcinoma. Harm Cancer. 2011;2:354.
6. Weiss LM. Comparative histologic study of 43 metastasizing and no metastasizing adrenocortical tumors. Am J Surg Pathol. 1984;8:163-9.
7. Kapoor A, Morris T, Rebello R. Guidelines for the Management of the Incidentally Discovered Adrenal Mass. Can Urol Assoc J. 2011;5(4):241-7.
8. Reibetanz J, Jurowich C, Erdogan I, Nies C, Rayes N, Dralle H, *et al*. German ACC study group: Impact of lymphadenectomy on the oncologic outcome of patients with adrenocortical carcinoma. Ann Surg. 2012;255:363-369,.
9. Gaujoux S, Brennan MF. Recommendation for standardized surgical management of primary adrenocortical carcinoma. Surgery. 2012;152:123-132.
10. Crucitti F, Bellantone R, Ferrante A, Boscherini M, Crucitti P. The ACC Italian Registry Study Group: The Italian Registry for Adrenal Cortical Carcinoma: Analysis of a multiinstitutional series of 129 patients. Surgery. 1996;119:161-170.
11. Allolio B, Hahner S, Weismann D, Fassnacht M. Management of adrenocortical carcinoma. Clin Endocrinal. 2004;60:273-87.
12. Polavarapu HV, Casillas S, Edmonds P, Lim PS, Pezzia CM. Adrenocortical Carcinoma: Complete Surgical Resection After 18 Years. World J Oncology. 2011;2(6):307-10.
13. Terzolo M, Baudin AE, Ardito A, Kroiss M, Leboulleux S, Daffara F, *et al.* Mitotane levels predict the outcome of patients with adrenocor- tical carcinoma treated adjuvant following radical resection. Eur J Endocrinal. 2013;169:263-270.

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