Case Report

Medical Exploration: A Comprehensive Case Study of an Adrenal Mass Linked with Hepatitis C, Nephrectomy, and Multifaceted Patient Care

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Abstract

A 53-year-old government police officer from Gujranwala, presented with left flank pain and a left kidney stone, treated with extracorporeal shock wave lithotripsy. The patient had comorbidities including Hepatitis C and insulin-dependent diabetes. Hepatitis C had been previously treated with oral medication and interferon. Further investigation revealed a large, left suprarenal tumour compressing the left kidney, diagnosed as an adrenal adenoma. Due to the significant tumour effect, nephrectomy and left-open radical adrenalectomy were performed. Histopathological examination confirmed metastatic hepatocellular carcinoma within the adrenal gland. Immunohistochemistry supported this diagnosis with positive Hep-Par1 and Arginase markers. Postoperatively, the patient experienced left-sided hemorrhagic leakage, managed conservatively without evidence of persistent bleeding. Although hepatocellular carcinoma was not found, a high-grade dysplastic nodule was observed. Sorafenib treatment was initiated due to medication intolerance. Follow-up showed no urological complications. This case highlights the complexity of managing metastatic hepatocellular carcinoma with adrenal involvement in a patient with multiple comorbidities.

Received: 26-12-2023 | **Revision:** 20-06-2024 | **Accepted:** 01-10-2024

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Keywords | Hepatitis C, Adrenal Mass, Nephrectomy, Antiviral Treatment

Introduction

Globally, hepatitis C virus infection is one of the most frequent causes of chronic liver disease. Apart from liver damage, chronic hepatitis C can also cause extrahepatic symptoms such glomerulonephritis, mixed cryoglobulinemia, lichen planus, porphyria cutanea tarda, Sjogren's syndrome, cardiomyopathy, and, according to a recent report, adrenal tumours.[1,2] Insulin resistance, which results in hyperinsulinemia, and elevated blood levels of insulin growth factor (IGF) have both been linked to chronic hepatitis C; in vitro studies have shown that both chemicals promote the proliferation of adrenal fasciculate cells. As a result, the hepatitis C virus may cause adrenal tumorigenesis, which may occasionally result in hyperaldosteronism.[3,4] In light of this, our work clarifies the special relationship between adrenal neoplasia and persistent HCV infection, offering insights into potential causes and treatment implications.

Case Report

With a BMI of 26.14, a 53-year-old government police officer from Gujranwala reported experiencing a left flank discomfort. His left kidney stone was treated with extracorporeal shock wave lithotripsy (ESWL), and he tested positive for hepatitis C. He was an insulin-depen-

Production and Hosting by KEMU

https://doi.org/10.21649/akemu.v30i4.5601

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dent diabetic. Left suprarenal tumour identified by CT scan (Figure No.1).

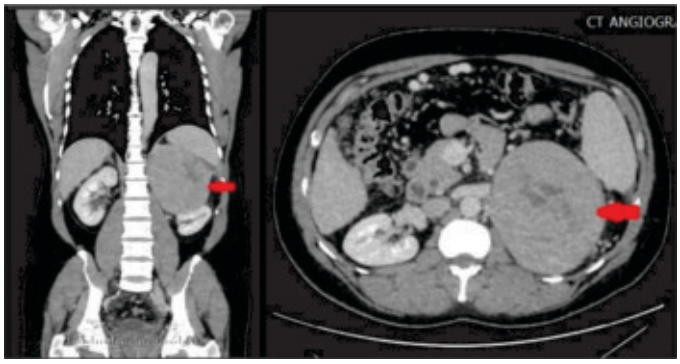

Figure 1: *CT scan showing Left Suprarenal Mass in Hepatitis C-associated adrenal metastasis.*

Injectable interferon initially produced a response for the patient, who was diagnosed with HCV in 1999, but a recurrence occurred in 2011. A sustained virological response (SVR) was induced by oral therapy in 2015; nevertheless, a recurrence occurred in 2017. Generalised discomfort, weakness, and pedal edoema were the remaining symptoms. The patient's liver cirrhosis PCR result was negative, the patient had a minimal surgical history, no history of substance abuse, and his diabetes was strictly managed for three years. In one instance, hepatocellular carcinoma (HCC) was not identified using magnetic resonance imaging (MR) as a post-HCV investigation. Upon further inspection, a left suprarenal tumour measuring 13.2 x 10.6 x 12.5 cm was found to be pushing on the left kidney. An endocrinology workup confirmed the presence of a non-functioning adrenal adenoma. Table 1 shows the serum aldosterone, serum renin, 24-hour urinary metanephrine, and aldosterone/renin ratio with their respective results and normal ranges.

Since the tumour had a considerable impact on surrounding tissues, the patient underwent both a left-open radical adrenalectomy and a nephrectomy. A big, encapsulated cancer with a greyish-green cut surface was revealed by histopathological investigation near the upper pole. The tumour was well-circumscribed, encapsulated, and organised in pseudo-glandular trabeculae under a microscope. The polygonal tumour cells showed large nucleoli and spherical nuclei full of eosinophilic cytoplasm. It was scattered with pigment from bile. An adrenal gland section showed microscopic foci of metastatic hepatocellular carcinoma surrounded by benign adrenal tissue. The kidneys' morphology was very typical in several sections. Renal and left adrenal gland cancer were linked to each other. The histopathological diagnosis of metastatic hepatocellular carcinoma was validated by immunohistochemistry, which identified Hep-Par1, Arginase, and CK-positive cancer cells. Tumour cell markers including inhibitor, CD117, CK7, PAX8, Melan-A, S100, chromogranin, and synaptophysin were lacking. (Figure 2).

Table 1: *Laboratory Values for Assessing the Functional Status of the Adrenal Mass.*

Test	Result	Units	Normal Range
Serum Aldosterone	5.3	ng/dL	Supine 3.0 - 16.0 ng/dL
Serum Renin	16.7	mU/L	4.4 - 46.1 mU/L
24-hour Urinary Metanephrine	50	µg/24h	<350 µg/24h
Aldosterone/Renin Ratio	0.32	-	<25

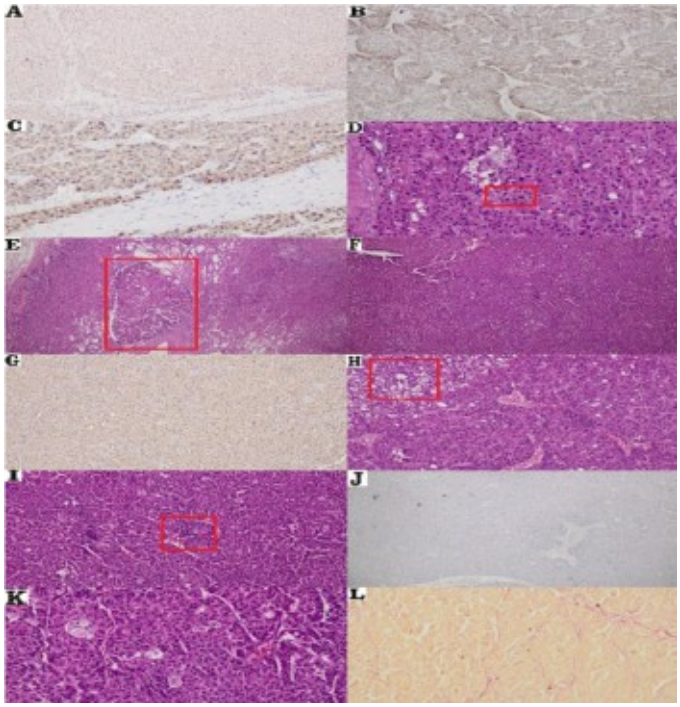

Figure 2: *A: Tumour Pax8 negative Part B: Tumour pan cytokeratin, C: The tumour tested positive for Heppar 1, D: The tumour had 400x bile pigment (bile was shown by the brown dots in the red box). E: Tumour deposit in adrenal 200x (tumour in red box, normal adrenal backdrop); F: 100x arrangement of tumour cells in a nesting pattern G: Positive ARGINASE, H: A 200x steatotic change in the tumour (the area in the red box displayed the steatotic change), I: A 200x*

nesting pattern of growth in the tumour made up of eosinophilic cytoplasmic cells (the area in the red box displayed the nesting pattern of growth), J: An inhibitor-negative tumour, L: Positive for bile stain; K:Tumour with a trabecular pattern of development 400x

The patient had left-sided hemorrhagic leakage after surgery; a CT scan examined this condition and found no signs of ongoing bleeding. The left surgical bed, however, showed evidence of a high-density hemorrhagic collection/hematoma. One day after surgery, the patient's MRI showed a stable hemorrhagic collection; a hepatologist was consulted. A high-grade dysplastic nodule was present at the segment VII/VIII junction, but no signs of HCC were present. The abdominal drain was taken out, and a urostomy bag was placed. The patient had an A6 Child-Pugh score and a PIVKA (Protein Induced by Vitamin K Absence) score of 1169. After just one week, the patient began to experience sensitivity to the tablet LENVATINIB 4 MG, which required a change in the prescribed course of therapy to sorafenib 200 mg oral dosage. Routine follow-up of patient showed palliative care with no ongoing treatment for primary disease.

Discussion

In the current environment, where the standard of care for adrenal tumours is minimally invasive adrenalectomy, open adrenalectomy plays a different role, predominantly found in regional referral centres. Large phaeochromocytomas (>8 cm) and probable malignant cortical adrenal tumours (>4-6 cm) are indications for open adrenalectomy, depending on the tumour's size or radiological evidence of local invasion. In our case, the tumour measured 13.2 × 10.6 × 12.5 cm, indicating the need for open adrenalectomy, aligning with these size-based criteria.[5]

Multidisciplinary collaboration—especially when liver or transplant surgeons are involved—may improve results in certain circumstances. Our case involved complex decision-making due to the patient's comorbidities, and the collaboration with a hepatologist postoperatively was essential, reinforcing published recommendations for multidisciplinary approaches in complex cases 5.

Predictors of adrenalectomy often involve advanced disease parameters such as higher T stage, nodal metastasis, and tumour thrombus. Despite the increased risk of recurrence in adrenalectomy, literature indicates no significant impact on overall survival, consistent with our patient's postoperative course, where no evidence of recurrence or urological complications was found during follow-up.[2,5]

Regarding adrenal tumour functionality, less than 20% gradually alter in function, with 70% remaining non-functioning, similar to the non-functioning adenoma observed in our case. Although the size and appearance of the tumour on CT were consistent with a benign adenoma, the histopathological examination confirmed metastatic hepatocellular carcinoma within the adrenal gland. This finding aligns with previous reports that adrenal metastasis must be considered in patients with a history of hepatocellular carcinoma, even when imaging suggests benign pathology.[6]

The link between adrenal tumours and Hepatitis C virus (HCV) is an innovative perspective in this case. HCV's recognised affinity for glandular tissues raises questions about its potential role in adrenal tumourigenesis, although the exact mechanisms are still unclear. Prior studies have shown the expression of insulin and insulin-like growth factors (IGF-I) in adrenal tumours, with increased serum levels of IGF observed in chronic viral hepatitis, including HCV. This insulin resistance and IGF pathway may contribute to adrenal tumour development, potentially acting as a link between long-term HCV infection and adrenal neoplasia.[7,8]

Our findings are consistent with the literature's hypothesis that IGF-I and insulin play a role in adrenal tumorigenesis[9,10]. However, further research is needed to clarify the genetic susceptibility and mechanisms behind HCV's contribution to adrenal neoplasms, as well as the effects of antiviral treatments on adrenal tumours in HCV patients. This case underscores the need for further investigation into the relationship between chronic HCV infection and adrenal tumour development, as these connections remain underexplored.

Conclusion

The study makes a substantial contribution to our understanding of an aspect of the extrahepatic impact of HCV that has not gotten much attention concerning problems related to diagnosis and therapy. It highlights how cha-

llenging it is to manage such complex clinical situations without ongoing research and a multidisciplinary team effort.

Conflict of Interest: None

Funding Source: None

Authors' Contribution

SM: Conception and design, or acquisition of data, Drafting the article or revising it critically for important intellectual content. Final approval of the version to be published.

NBN: conception and design, or acquisition of data, Drafting the article or revising it critically for important intellectual content. Final approval of the version to be published

NZ: conception and design, or acquisition of data, Drafting the article or revising it critically for important intellectual content. Final approval of the version to be published.

AR: conception and design, or acquisition of data, Drafting the article or revising it critically for important intellectual content. Final approval of the version to be published.

SI: Drafting the article or revising it critically for important intellectual content. Final approval of the version to be published. Agreement to be accountable for all aspects of the work in ensuring that questions related to the accuracy or integrity of any part of the work are appropriately investigated and resolved

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