Sri Lanka Journal of Medicine Vol. 34 No.1,2025

SLJM

Sri Lanka Journal of Medicine

Case Report

Citation: Arudchelvam J, Ariyaratne JC. 2025. Delayed metastatic recurrent hepatocellular carcinoma. Sri Lanka Journal of Medicine, pp 34-38. DOI: https://doi.org/10.4038/sljm.v34i1.566

A Successful Excision of a Delayed Metastatic Recurrent Hepatocellular Carcinoma on the Right Kidney Invading the Inferior Vena Cava: A Case Report

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ABSTRACT

Hepatocellular carcinoma (HCC) is reported to recur at a rate of 75% to 100% at 5 years. Recurrent disease associated with a survival of less than six months. Delayed metastatic recurrent HCC (DHCC) invading into the inferior vena cava (IVC) is rare. We report a DHCC of the right kidney with involvement of the IVC in a 50-year-old female. Computerised tomographic scan (CT) showed an 11cm * 10 cm tumour in relation to the upper pole of the right kidney. This was managed successfully with radical nephrectomy and IVC tumour removal with reconstruction of the IVC with a polyester patch.

Keywords: Hepato cellular carcinoma, delayed metastasis, inferior vena cava

INTRODUCTION

Hepatocellular carcinoma (HCC) is an aggressive tumour. It is reported to recur at a rate of 75% to 100% at 5 years (1). Delayed metastatic recurrent HCC (DHCC) invading into the inferior vena cava (IVC) is rare. On a Google search using the keywords "metastatic hepatocellular carcinoma", and "inferior vena cava invasion" no reports were found. HCC metastatic recurrence is associated with poor prognosis (2). Meanwhile, HCC secondary spreading along the IVC is likely to be associated with poorer survival than metastatic disease without IVC invasion. We report a DHCC of the right kidney with involvement of the IVC that was managed successfully with radical

nephrectomy and IVC tumour removal with reconstruction of the IVC with a polyester patch.

CASE REPORT

A 50-year-old female presented with nonspecific right upper quadrant abdominal pain. The ultrasound scan (USS) of the abdomen showed a large tumour in relation to the upper pole of the right kidney. A computerised tomographic scan (CT) of the abdomen and pelvis was done. CT scan revealed an 11cm * 10 cm tumour arising from the upper pole of the right kidney (Figure 1). In addition, there was a tumour thrombus extending along the renal vein into the IVC to a level just



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below the hepatic veins. The mass was extending superiorly, posterior to the liver. The tissue planes between the tumour and the liver were welldefined. The serum Alfa fetoprotein (AFP) level was normal.



Figure 1: Computerised tomographic scan (CT) showing the metastatic hepatocellular carcinoma (yellow arrow) and the invasion into the inferior vena cava (blue arrow)

The patient had a past history of HCC, two years before the current presentation. For that, she underwent liver resection with a clear histological margin. She did not have cirrhosis, hepatitis B, hepatitis C or evidence of other liver disorders.

A radical excision of the metastatic tumour with radical nephrectomy and IVC tumour removal was planned. A midline laparotomy incision with a lateral extension to the right side starting about an inch above the umbilicus was done. The liver was fully mobilised. The tumour was extending along the right renal vein to the retro hepatic IVC to a level just below the hepatic veins. The tumour with the surrounding tissues were dissected. The infrahepatic and the infra-renal IVC was mobilised. The retro hepatic IVC was dissected away from the liver up to the level of the hepatic veins. Vascular clamps were applied to the retro hepatic IVC (above the intra IVC part of the tumour), the infrarenal IVC and the left renal vein. The IVC was opened and the tumour was found to be infiltrating into the IVC wall near the renal vein orifice. A radical nephrectomy with the tumour, adrenal gland with the cuff of IVC and the intra caval tumour was excised en bloc (Figure 2). After the excision, the defect on the IVC involved more than 50% of its circumference. Therefore, it was repaired with a polyester patch (Figure 3). The patient made an uneventful

recovery. The histology revealed a hepatocellular carcinoma (HCC) infiltrating into the upper pole of the kidney. The margins were clear. The patient was referred to the oncologist for further follow-up. She was started on a multi-kinase inhibitor (Sorafenib).



Figure 2: Specimen showing the metastatic hepatocellular carcinoma (arrow) with the kidney



Figure 3: Intraoperative image showing the Polyester patch (yellow arrow), the inferior vena cava (black arrow) and the liver (blue arrow)

DISCUSSION

Metastatic secondaries from HCC to the kidneys and it extending into the IVC are rare. The reported survival of patients with recurrent metastatic HCC is less than six months (2).

Usually, the secondaries manifest during the first 2 years of the initial management (1). the metastasis from HCC usually occurs by blood and less commonly by lymphatics (3). The common sites of HCC secondaries are the lungs, lymph nodes and adrenal glands (4). Secondaries to the kidneys are rare (5). Spread to the kidney can occur due to direct spread or by haematogenous spread. In this patient, the peri nephric fat was not infiltrated and the margins of the specimen were clear. In addition, there was no attachment of the tumour to the liver microscopically. Therefore, the spread is probably haematogenous.

For surgical purposes, the level of the extension of the tumour into the IVC is classified as below. Tumours limited to the renal vein are categorised as level I. The tumours extending into the IVC from the renal vein but limited to the intrahepatic segment of the IVC are classified as level II. The tumours extending to the retro hepatic IVC to the hepatic venous level are classified as level III. The tumours extending above the hepatic venous level were classified as level IV (6). This patient had a level III tumour.

The tumours invading the IVC present with lower limb oedema, varicocele, hepatic venous outflow obstruction (HVOO), etc. Due to the nonspecific nature of the above presentations, the diagnosis is often missed or delayed. In addition, patients may present with pulmonary embolism and sudden death due to tricuspid orifice occlusion (7).

The imaging modalities used to characterise recurrent HCC include the ultrasound scan (USS), computerised tomographic scan (CT) and magnetic resonance imaging (MRI).

The USS is useful in the initial identification of the metastatic. USS is also useful in the detection of IVC tumour thrombus but it has a lower sensitivity. Therefore, CT scan or MRI evaluation should be done for complete evaluation.

The CT scan is useful to determine the local extension and the level of extension into the IVC.

CT scan has a sensitivity and specificity of 85% and 98% for detection of venous invasion (8). However, a CT scan is not a good investigation for detecting venous wall infiltration. Sometimes the true extent of the venous extension is difficult to assess due to the presence of flow artefacts especially if the IVC is completely occluded by the tumour. The 2D echo and trans-oesophageal echocardiogram are useful to assess the intra-cardiac extent.

MRI is a useful imaging technique to assess the tumour and the IVC invasion. MRI has a specificity and sensitivity of almost 100% for assessment of the IVC tumour and the extent. MRI is also accurate for the detection of venous wall infiltration. It is also a better modality for the demonstration of the tissue planes (8).

The treatment of delayed metastatic recurrent HCC is not well established. The surgical resection is associated with improved survival and resection also prevents sudden death due to tumour embolisation and tricuspid occlusion (9). For example, one retrospective study revealed that aggressive treatment with radical excision of metastatic deposits and regional therapy combined with systemic therapy is associated with improved median survival i.e.44.0 months compared to only 10.6 months in non-resected patients (10).

The options for IVC reconstruction include; primary lateral repair (lateral venography), repair with a patch, excision of IVC and reconstruction with a synthetic graft. It the luminal narrowing is less than 50%, a primary lateral repair can be done. If there is a narrowing of more than 50%, it is repaired with a patch (native vein, biological or synthetic) as in the above patient. If the IVC is already completely occluded by the tumour and there is adequate collateral flow, it is excised and the ends are ligated. However, before the IVC is ligated, the distal stump pressure is measured. If the stump pressure exceeds 30 mmHg, repair of the IVC is advised to prevent venous hypertension.

The HCC is chemo-resistant. Therefore specific guidelines for the adjuvant treatment are lacking. However multi-kinase inhibitors (Sorafenib or Lenvatinib) (11) and combined treatment with multi-kinase inhibitors and immunotherapy (Bevacizumab or Atezolizumab) are given for unresectable tumours in some centres.

CONCLUSIONS

This case illustrates that delayed metastatic recurrence of the HCC can occur without liver recurrence. Therefore, in patients who had HCC in the past, metastatic recurrence must be suspected when they present with extra hepatic tumours later. The available literature points towards improved survival following radical resection of the metastatic secondaries. However, the prognosis of the excision of extrahepatic secondaries with IVC invasion is not available. Since there are no cases reported like the case described above, long-term follow-up of this case and more such cases is essential to determine the outcome of such tumours.

Author declaration

Acknowledgement None.

Authors' contributions:

Conceptualization and Design: JA, MNJ; Literature Survey: JA; Surgery: JA, MNJ; Manuscript Writing: JA; Image Acquisition: JA, MNJ; Manuscript Review: JA

Conflicts of interest:

The authors declare that there is no financial or nonfinancial conflict of interest.

Funding statement:

Self-funded.

Ethics statement:

Written informed consent was obtained from the patient before they participated in the case, ensuring their understanding of the purpose, procedures, and potential implications involved.

Statement on data availability:

All data generated during this study are available upon request from the corresponding author.

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