CASE REPORT

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Renal cell carcinoma with tumour thrombus adherent to inferior vena caval wall: A case report

Niveditha S[1]✉, **Abhijit Dhale**[2], **Meenakshi Yeola**[3]

[1]Resident, Department of General Surgery, Datta Meghe Institute of Medical Sciences, Wardha, Maharashtra, India
[2]Assistant Professor, Department of General Surgery & Urosurgery, Datta Meghe Institute of Medical Sciences, Wardha, Maharashtra, India
[3]Professor & HOD, Department of General Surgery, Datta Meghe Institute of Medical Sciences, Wardha, Maharashtra, India

✉**Corresponding author**
Resident, Department of General Surgery, Datta Meghe Institute of Medical Sciences, Wardha, Maharashtra, India;
Email: devu.devoos@gmail.com

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General Note
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ABSTRACT

To report a case of left renal cell carcinoma with tumour thrombus is extending into inferior vena caval wall. *Case report*: A 56 year old female patient presented with left flank pain and painless hematuria of 1 month duration. Clinical examination revealed a bimanually palpable lump in left lumbar region. Further investigation with CECT abdomen & pelvis revealed a mass arising from left kidney with tumour thrombus extending into IVC (Level III). The patient underwent preoperative angioembolization of left renal artery followed by left radical nephrectomy with IV cavotomy and tumour thrombus removal. However intraoperatively it was found

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that the tumour thrombus was not just abutting the wall of IVC instead it was adherent to the IVC wall making its removal difficult & hence gradual peeling of thrombus was done with cardiopulmonary bypass and hypothermic cardiac arrest which in turn lead to severe blood loss and prolonged surgical time. This case is considered important because a multidisciplinary approach with CPB helped us in overcoming an unexpected intraoperative complication and successful completion of the surgery. Moreover this case also emphasizes on the fact that radiological investigations can underestimate the difficulty in surgery and being prepared with CPB standby is necessary before attempting such a case.

Keywords: Renal cell carcinoma; venous tumour thrombus; IVC wall invasion.

1. INTRODUCTION

Tumor thrombus extension into the inferior venacava (IVC) is usually found in the terminal stage of malignant neoplasms like retroperitoneal tumors, gynaecological malignancies, hepatocellular carcinoma & renal cell carcinomas (RCC) (Tsuji et al., 2001). Renal Cell Carcinoma has got a tendency for invading vascular structures. The tumour thrombus can either involve renal vein or can grow intravascularly into IVC and can even extend into right atrium and right ventricle (Tsuji et al., 2001; Topaktaş et al., 2019). The case with tumour extension into IVC and cardiac chambers requires a multidisciplinary surgical approach with good cardiopulmonary stand by back up. The single best determining factor for good surgical outcome in cases with IVC thrombus is complete removal of the thrombus from the IVC (Tsuji et al., 2001; Westesson et al., 2014). For complete removal, the thrombus has to be floating in the IVC and not adherent to IVC wall and as such a thrombus cannot be completely removed. Preoperative radiological investigations which can differentiate between extension into IVC and invasion of IVC wall are limited. Prognosis of patients who underwent radical nephrectomy and complete thrombectomy is determined by multiple factors like extension of thrombus, involvement of IVC wall, percentage of thrombus removed, duration of surgery, blood loss etc. The objective behind reporting this case is that it is the first case of RCC with IVC thrombus with invasion into IVC wall that underwent preoperative angioembolisation followed by successful Radical nephrectomy with IVC thrombectomy with cardiopulmonary bypass and hypothermic cardiac arrest in our rural set up.

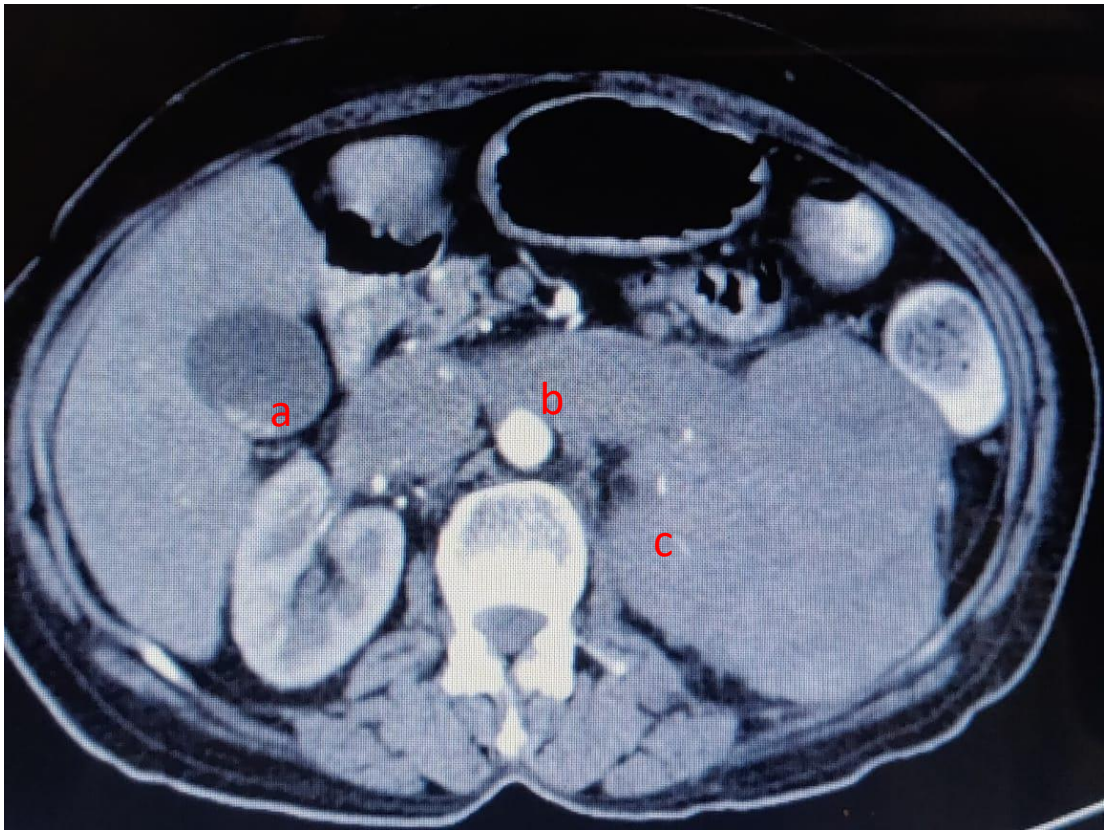

Figure 1 Axial Reconstruction showing arterial phase in CECT: a) Inferior Vena Cava; b) Left Renal Vein distended with thrombus; c) Left Kidney with tumour replacing renal parenchyma

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2. CASE REPORT

56 year old female patient who is a hypertensive not on regular treatment presented with complaints of pain in left flank, painless hematuria of 1 month duration. She also gave history of weight loss and loss of appetite. There was also associated burning micturition, on and off fever, nausea, vomiting and dyspepsia since 1 month. There is a past h/o hysterectomy 20 years back – details not available. On clinical examination, a bimanually palpable mass was present in left lumbar region.

On further evaluation, chest radiograph was normal. CECT abdomen and pelvis done was suggestive of heterogeneously enhancing mass lesion noted involving the upper and mid pole of the left kidney with few areas of necrosis within. The lesion measured 10.5 x 9.5 cm. The lesion was extending into the left renal vein, infra-hepatic and intra-hepatic part of IVC and left ovarian vein in the form of a filling defect (Figure 1). MRI abdomen and pelvis for assessment of wall invasion was not done as CT was not suggestive of any filling defect between the tumour thrombus and IVC wall, which was in favor of non-invasion of vessel wall by thrombus.

Preoperatively patient underwent selective Left renal artery embolization to reduce the risk of intraoperative bleeding (Figure 2).

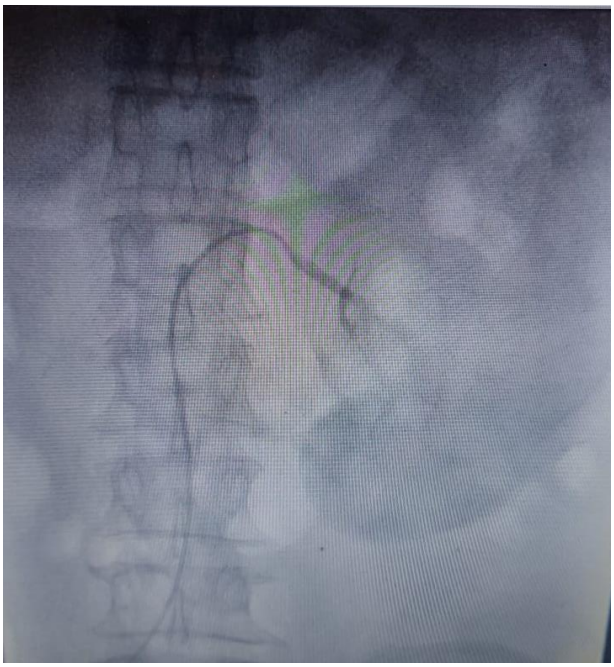

Figure 2 Preoperative selective angioembolization of left renal artery

Intraoperatively, a midline incision was taken and deepened, right colon was mobilized to expose IVC and left colon was mobilized to expose left kidney. It was found that the tumour was arising from upper and middle pole of left kidney and involved left suprarenal gland, spleen, left ovarian vein and tumour thrombus extended into IVC (Level III). Intraoperatively after taking proximal and distal control of the IVC, IV cavotomy was done. While removing thrombus, it was observed that the thrombus was stuck to the wall of IVC (Level IIIA as per ROBSON staging system). Hence gradual peeling of thrombus from the IVC wall was done. As this procedure was causing lot of blood loss, decision was taken to put the patient on cardiopulmonary bypass (CPB) and hypothermic cardiac arrest to complete the thrombectomy. We were able to successfully complete the surgery (Figure 3) and patient was shifted to Cardiac ICU. Post operatively she recovered well and follow up was kept for a period of 1 year.

3. DISCUSSION

The first reported nephrectomy with venacavotomy for renal cell carcinoma with IVC extension was in 1913 by Berg. Since then, this procedure has become the standard surgical management for RCC with IVC tumour thrombus (Tsuji et al., 2001; Lawindy et al., 2012). In adults, RCC comprises 3% of malignancies and 90% to 95% of renal neoplasms and is the most lethal, with a mortality rate of 40% among urological cancers. Venous insufficiency and thromboembolism may be associated with tumor thrombus (Bagga et al. 2020) extending into the IVC, and it indicates the need for investigating RCC. According to studies, around 4-10 % of patients with RCC have IVC involvement and 1% has tumor thrombus extension into right atrium (Agarwal et al., 2018). Venous thrombus is more commonly seen in cases of right renal tumours and this is because of the shortness of the right renal vein.

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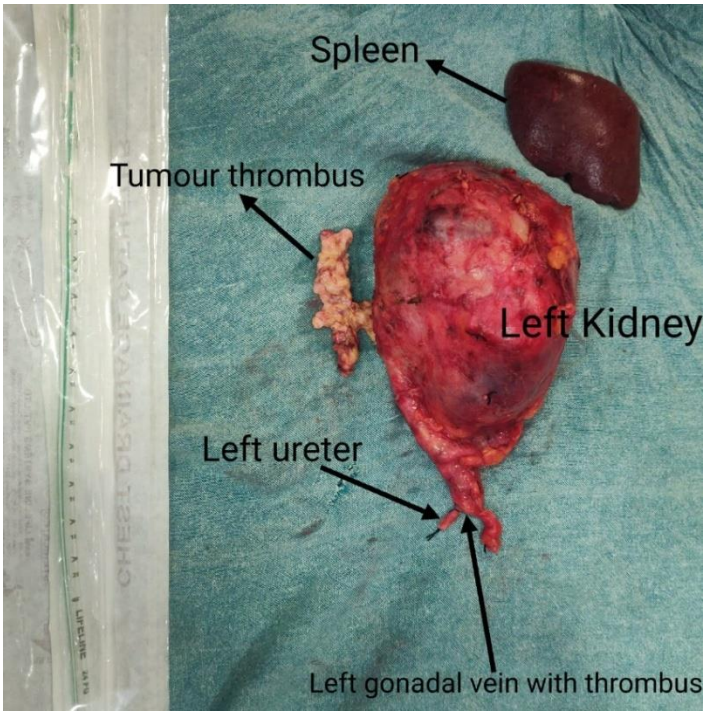

Figure 3 Post operative specimen. Infant Feeding Tube for scale

Radiological investigations differentiating the kind of IVC involvement by tumour thrombus should be given priority. In our case, the patient was evaluated with CECT abdomen and pelvis with which the origin, size, extend of the tumour, involvement of adjacent structures, presence and extent of IVC thrombus etc. could be studied. However, the invasion of IVC wall with tumour thrombus was not diagnosed. Performing this surgery in a cardiovascular operating theatre was of added advantage such as facilitating toward CPB when required with a good cardiovascular surgical team ready together with an anesthetic team familiar with cardiovascular procedures (Tsuji et al., 2001; Agarwal et al., 2018). Intraoperatively this tumour thrombus being adherent to IVC wall caused great difficulty during its removal. Here comes the cardiopulmonary bypass stand by and hypothermic cardiac arrest into play. Removing the tumour thrombus in a single step was not feasible and causing lot of blood loss. Hence the patient was put on CPB support and hypothermic cardiac arrest and gradual removal of the tumour thrombus was done. As we had a good CVTS back up, surgery was successfully completed in our patient.

Patients with thrombus extending to the renal vein, IVC or right atrium are always a challenge. A multidisciplinary approach is of utmost importance in the treatment of these patients. An early radical surgery is indicated. Moreover importance should be given to cavotomy more than that to nephrectomy as complete thrombus removal is the main determinant factor of postoperative survival. Preoperative angioembolization should be encouraged as this greatly helps in reducing intraoperative blood loss as well as regresses the size of the tumour and thereby making resection easier (Masic & Smaldone, 2019). Preoperative angioembolic infarction studies showed that the cancer specific 5-year survival rate after radical nephrectomy and thrombectomy were 33.1% (Psutka & Leibovich, 2015). The level of thrombus determines the surgical technique like limited or extensive IVC dissection (Woodruff et al., 2013 & Polańska-Płachta et al., 2015).

Even with a high risk of peri and postoperative mortality we think that all patients with RCC and IVC tumour thrombus, should be considered for surgery as the treatment is aimed at the removal of an immediately life threatening focus of disease. The availability of radiological investigations, interventional radiological procedures, a multidisciplinary surgical team with commitment and good CVTS set up will lead to better success rates.

4. CONCLUSION

We conclude that cases of RCC with IVC thrombus though operable can be tricky and radiological diagnosis can be misleading. Such cases when operated in fully equipped tertiary care centers with good CVTS backup can give good long term prognosis.

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Author contributions

Details of contribution of each authors regards manuscript work & production.

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Conflict of interest

The authors declare that there are no conflicts of interests.

Informed consent

Written & Oral informed consent was obtained from the patient included in the study. Additional informed consent was obtained from all individual participants for whom identifying information is included in this manuscript.

Ethical approval

The study was approved by the Medical Ethics Committee of Datta Meghe Institute of Medical Sciences [Deemed University]. Ethical approval code: DMIMS (DU)/ IEC/ 2018-19/7447.

Data and materials availability

All data associated with this study are available upon request to the corresponding author.

Peer-review

External peer-review was done through double-blind method.

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