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IVC Thrombectomy in a Patient with Adrenal Tumor with IVC Thrombus

ABSTRACT

Introduction: Adrenocortical carcinoma (ACC) is a rare malignancy with a poor prognosis, and the association with tumour thrombus into the inferior vena cava (IVC) is infrequent. Radical surgery is the best treatment for locoregional disease. **Case Report:** We herein report a case of a large ACC of the left adrenal gland extending into the IVC through the left renal vein in a 68-year-old male patient. He presented with pain in the left side of the abdomen for one month and significant weight loss (7 kilograms). On examination, a hard irregular non-ballotable lump was palpable in the left lumbar region. Ultrasonography, computed tomography, and whole-body PET CT all revealed a large mass over the upper pole of the left kidney with tumour thrombus in the IVC. Laboratory tests showed creatinine levels of 0.9 mg/dl (normal range: 0.5–1.2 mg/dl) while plasma levels of cortisol, free metanephrines were normal. A midline laparotomy was performed, and the tumour was completely excised with regional lymphadenectomy, ipsilateral radical nephrectomy and IVC thrombectomy. **Results and Discussion:** We emphasize that adrenal cortical carcinoma is a rare tumour and can have tumour thrombi invading the IVC. Such cases do not represent a contraindication to surgery, and we suggest radical surgical removal of cancer with the thrombus.

Key words: IVC, Thrombus, Adrenocortical carcinoma, Adrenal tumour

INTRODUCTION

Adrenocortical carcinoma (ACC) is a rare malignancy associated with a poor prognosis.[1] The incidence of non-metastatic local extension into the inferior vena cava (IVC) is not well defined. It was first reported in 1972[2] and since then only single case reports and small series have been reported. Despite its aggressive nature, several studies have indicated that radical surgical resection can improve survival rate.[3-6] We have previously reported 100 IVC thrombectomy in renal cell carcinoma.[7] But herein we report the first IVC thrombectomy in a patient with adrenal tumour with IVC thrombus in our experience and review the literature.

CASE REPORT

Medical history

A 68-year-old man, without any significant history, presented with pain in the left side of the abdomen for 1 month and considerable loss of weight (7 kg). Physical examination revealed a hard irregular non-ballotable lump in the left lumbar region. A CT scan of abdomen, pelvis, and chest confirmed that the mass (13.7 cm × 11.2 × 15.2 cm) originated from the left adrenal gland, displacing the left kidney downwards and the spleen laterally, with multiple enlarged left upper para-aortic lymph nodes, largest measuring 1.5 cm × 2.5 cm with tumour thrombosis involving left renal vein and intrahepatic IVC. A whole-body PET CT was negative for bone metastases and confirmed the above findings (Figure 1).

Kulkarni Jagdeesh[1], Tillu Neeraja[2]

[1]*Department of Urology, Bombay Hospital and Institute of Sciences, Mumbai, Maharashtra, India,* [2]*Department of Genitourinary Oncology, Asian Cancer Institute, Cumballa Hill, Mumbai, Maharashtra, India*

Corresponding Author:
Tillu Neeraja, Asian Cancer Institute, Mumbai, Maharashtra, India.
E-mail: drneerjatillu@gmail.com

Laboratory tests showed creatinine levels of 0.9 mg/dl (normal range: 0.5–1.2 mg/dl) while plasma levels of cortisol, free metanephrines were normal. Considering large left adrenal mass with tumour thrombosis involving left renal vein and IVC, we decided on a surgical approach.

Surgical intervention

The surgical procedure started with a midline laparotomy. After dissecting all the bowel out of the field and mobilizing IVC, right and left renal vein, we proceeded with an *en bloc* resection of the mass and the para-aortic lymph nodes, with ipsilateral left radical nephrectomy and the tumour thrombus involving left renal vein. The intrahepatic IVC was prepared, and venous control was achieved by placing three tourniquets (two on the IVC, under and above the renal vein and one around the right renal vein). After caval clamping, the thrombectomy was performed by a longitudinal incision of the cava. The caval incision was closed by a direct suture. The postoperative course

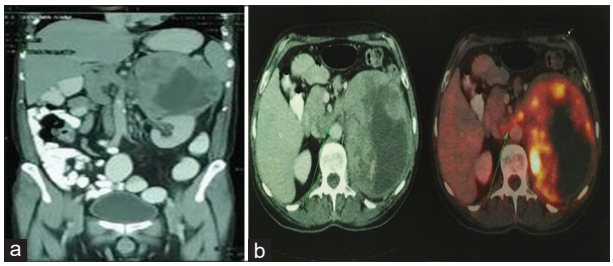

Figure 1: (a and b) CT scan and PET CT shows the mass (13.7 cm × 11.2 ×15.2 cm) originated from the left adrenal gland, displacing the left kidney downwards and the spleen laterally, with multiple enlarged left upper para-aortic lymph nodes largest measuring 1.5 cm × 2.5 cm with tumour thrombosis involving left renal vein and intrahepatic IVC

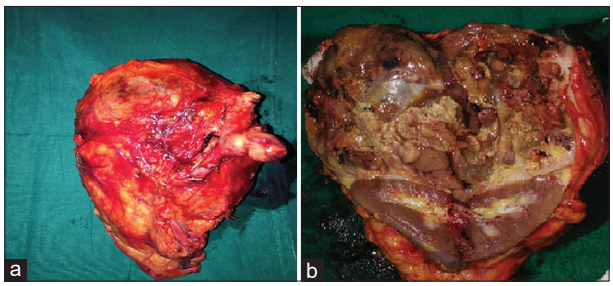

Figure 2: (a and b) Large left adrenal mass with extension into IVC (intact specimen and cut open specimen)

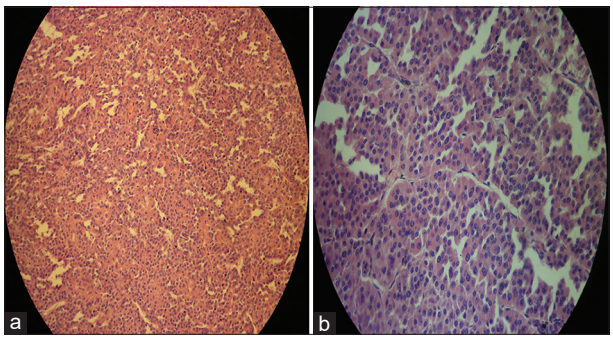

Figure 3: (a and b) Low power and high-power view showing high-grade malignant tumour probably of adrenocortical origin, composed of sheets and solid nests of tumour cells which are polyhedral with enlarged, hyperchromatic vesicular nuclei having prominent nucleoli and a moderate amount of cytoplasm

was uneventful. Histological examination revealed a high-grade malignant tumour of adrenocortical origin, composed of sheets and solid nests of tumour cells that are polyhedral with enlarged, hyperchromatic vesicular nuclei with prominent nucleoli and a moderate amount of cytoplasm. Brisk mitotic activity with atypical mitoses was noted with lymphovascular emboli. Tumour invaded into the capsule, however not beyond, and it also extended into the IVC and left renal vein. Normal adrenal and the left kidney was seen compressed, and all the surgical margins were free of tumor (Figure 2). Two out of six paraaortic lymph nodes showed metastases with extranodal extension (Figure 3). The patient was advised adjuvant mitotane therapy, and the latest follow-up shows no residual disease after 24 months of adjuvant mitotane treatment.

DISCUSSION

ACC can affect the IVC by compression, direct invasion of the venous wall or by intraluminal extension in the form of thrombus (without attachment to the venous wall). Tumour thrombus can subsequently cross the cavoatrial junction and progress into the right atrium.[8] IVC extension is more commonly seen on the right due to its shorter length. But our case had left renal vein thrombosis extending into IVC. Contrast CT scan and MRI are currently considered the best modalities for assessment of ACC with IVC extension.[9,10] The advantage of MRI lies in distinguishing tumour thrombus from fibrinogenic thrombus.[11] However, involvement of the vein wall can be most accurately assessed during surgical exploration only.

The optimal surgical approach to such cases depends on the size of the tumour, the upper limit of IVC extension, and the need for associated procedures (for structures being involved by lymphatic or contiguous spread). A laparotomy is sufficient for exposure of infrahepatic or retrohepatic caval extension, whereas a combined thoracic and abdominal approach is the preferred technique for patients with suprahepatic caval involvement. Laparotomy options include median and unilateral or bilateral subcostal. In our case, we used the midline laparotomy approach. Given the left renal vein invasion by tumour thrombus and normal left kidney on imaging, we decided on autotransplantation of the left kidney at the institutional tumor board meeting. But intraoperatively it was not feasible, so we performed a concurrent left radical nephrectomy.

Radical surgical resection is controversial because of the poor prognosis of these tumours and technical difficulties related to venous control and vascular reconstruction.[12,13] Several reports have shown that complete resection of the primary tumor and its venous extension can prolong survival and improve quality of life.[14-20] In comparison, only partial response rates with no impact on survival rate to mitotane without radical resection have been reported.[20] Since the risk of postoperative recurrence due to advanced presentation of the disease was high, our use of mitotane in adjuvant setting was justified. We believe that complete resection of ACC with IVC thrombus is feasible with careful patient selection. That being said, radical resection is to be avoided in patients with severe comorbidities or metastatic disease.

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