

CASE REPORT

Simultaneous management of renal carcinoma with caval vein thrombosis and double coronary artery disease

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Summary

Introduction: Recent advances in surgical and anesthesiology techniques allow simultaneous thoracic and abdominal operations to be performed for severe heart disease and benign or malignant abdominal diseases.

Case report: The simultaneous surgical management in a 75-year-old patient suffering from severe double coronary artery disease and a renal cell carcinoma with extended intravascular growth into the inferior vena cava is reported.

Conclusion: The postoperative course was uneventful. Simultaneous surgery proved to be beneficial and safe, showing optimal results in our patient.

KEY WORDS: Kidney tumor; Coronary heart disease; Caval thrombus; Hypothermic circulatory arrest.

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INTRODUCTION

Neoplastic invasion of the inferior vena cava occurs in 5-15% of the patients with renal cancer (1). In these cases, curative resection might be possible with reasonable-long-term survival. Various surgical techniques have been described for these tumors (2, 3). Because of the complexity of achieving vascular control, surgical treatment in deep hypothermic circulatory arrest using cardiopulmonary bypass has been established as an interdisciplinary concept (3-6).

We report the case of a patient affected by severe double coronary artery disease and voluminous renal cell carcinoma with extended intravascular growth into the inferior vena cava.

CASE REPORT

In a 75-year-old man (180 cm, 75 kg) a computed tomography (CT) scan demonstrated a malignant tumor (85x64x88 mm) of the right kidney with continuous growth of a tumor cone into the subdiaphragmatic vena cava (Figure 1).

Figure 1.

Right kidney mass with continuous growth into the subdiaphragmatic vena cava.



The reported symptoms were microhematuria, cough and evening fever.

The ECG demonstrated signs of a small previous lateral infarction. Coronary angiography and ventriculography revealed a severe double-vessel coronary artery disease and a concentric remodeling hypertrophy of the left ventricular with normal ejection fraction (0.63).

The operation was conducted with an interdisciplinary approach by urologists and cardiothoracic surgeons.

In the first step of the operation, urologists performed the radical right nephrectomy through a median laparotomy.

In the second step a median sternotomy was performed. The left internal mammary artery (LIMA) and a segment of saphenous vein were harvested. Systemic heparinization was established by administering 300 IU/Kg with an activated clotting time target > 480 seconds.

Cardiopulmonary bypass (CPB) was initiated by ascending aorta cannulation with a 22 F arterial cannula and by a right atrial appendage cannulation with a 52 F venous cannula. CPB was started and the patient's body was cooled up to 20°C of esophageal temperature. During body cooling, coronary artery bypass grafts were performed on beating heart. Vein graft was distally anastomosed on the obtuse marginal branch with a running 7-0 monofilament polypropylene suture. The proximal site of the vein graft was anastomosed on the ascending aorta by the HeartString device (Maquet, Hirrlingen, Germany) with a running 6-0 monofilament polypropylene suture without clamping the ascending aorta. Finally, the LIMA was distally anastomosed on the left anterior descending artery with a running 8-0 monofilament polypropylene suture. The heart initiated to fibrillate at 27°C degree and the left ventricle was vented through a 18 F catheter inserted into the left ventricle through the right upper pulmonary vein. Hypothermic circulatory arrest (HCA) was established when the body reached a 20°C of esophageal temperature and it was maintained while tumor-thrombus was being removed from the abdominal inferior vena cava (IVC). Abdominal IVC was open through a 5 cm longitudinal incision. Complete tumor-thrombus resection was performed under direct vision by advancing a Foley catheter and by forceps. Direct vision, several index finger maneuvers and the use of intraoperative transesophageal echocardiography confirmed the complete tumor resection. The opening of right atrium was not necessary. Cavotomy was closed with a running 4-0 monofilament polypropylene suture without narrowing the lumen.

CPB was restarted after 32 minutes of HCA and the body was progressively heated until 36°C of esophageal temperature. Then the CPB was rapidly weaned off and heparin was antagonized with sulphate protamine.

After closure of the thorax and the abdomen the patient was transferred to the post-operative intensive care unit. Perioperatively the patient received 6 units of red blood cells, 3 units of fresh frozen plasma and 1 unit of platelets. Extubation was achieved 12 hours postoperatively. Anticoagulation using only intravenous heparin was applied for 7 days. The patient was transferred to the normal ward on the second post-operative day. The post-operative course in the ward was uneventful and the patient was transferred to the rehabilitation clinic on the 30th postoperative day.

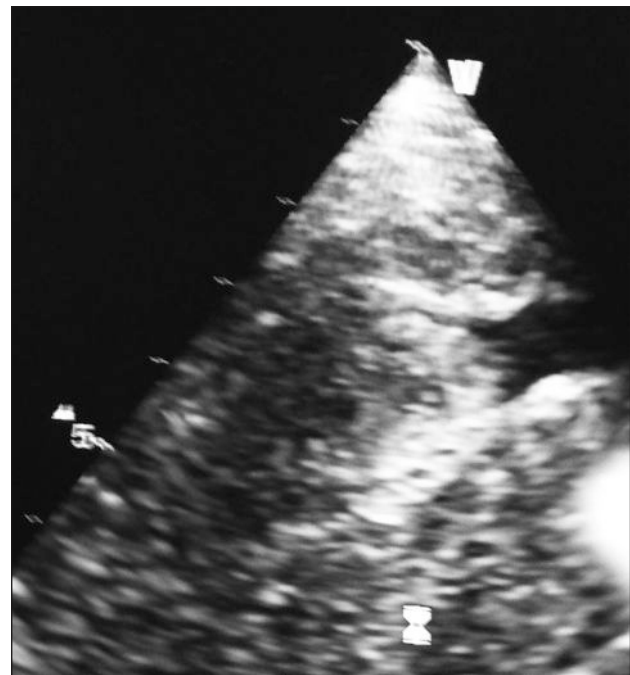
Figure 2.

Cavotomy.



Figure 3.

Intraoperative endoesophageal ultrasound, showing the caval thrombus.



DISCUSSION

The number of patients who have both critical coronary artery disease (CAD) and surgically resectable cancer concomitantly has been raising as the proportion of elderly in the general population increases, therefore new

routes have been attempted to deal with concomitant life-threatening pathologies (7).

Tumors invading the juxtahepatic caval vein require an interdisciplinary therapeutic approach and hypothermic circulatory arrest.

Recent advances in surgical and anesthesiology techniques allow simultaneous thoracic and abdominal operations.

Despite the aggressiveness and biological invasiveness of the tumor and the intervention performed in deep hypothermia and circulatory arrest, the results are encouraging (8).

Westaby documented the increased operative risk for non-cardiac procedures performed on individuals with major coronary artery disease (9), but postponing the tumor resection might increase the risk of exposure to the immunosuppressive effects of cardio-pulmonary bypass, which can have a harmful effect on tumor growth and spreading (10-11).

Furthermore the doubling of costs which can be avoided has to be considered.

CONCLUSION

To our knowledge only few similar cases were reported in literature. Franke reports a case in which the bypass was performed during cardioplegia in the heating phase (12), whereas in our patient the bypass was performed on the beating heart during the cooling phase.

In high surgical experience centers, a multidisciplinary approach can ensure a safe and optimal treatment.

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