Fatal Intraoperative Cardiac Thrombosis in a Patient with Renal Cell Carcinoma

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A 61-YR-OLD man with renal cell carcinoma and inferior vena cava thrombus presented for nephrectomy with thrombectomy. Preoperative echocardiography was normal and excluded a patent foramen ovale.

During inferior vena cava dissection, the patient developed an acute decrease of end-tidal carbon dioxide and a loss of arterial pressure with waveform nonresponsive to cardiopulmonary resuscitation.

Emergency transesophageal echocardiographic examination revealed extensive thrombosis of the right heart chambers (right atrium [RA], right ventricle [RV]) and, unexpectedly, significant left ventricular (LV) and left atrial (LA) thrombus (fig. A). Figure B provides for comparison a normal transesophageal echocardiography four-chamber view from a different patient. The extensive thrombus observed in all four heart chambers explained the inefficacy of cardiopulmonary resuscitation efforts and excluded cardiopulmonary bypass as a viable alternative.

Renal cell carcinoma is associated with a hypercoagulable state, which results in inferior vena cava thrombosis in 4–10% of cases.1 The etiology of this devastating intracardiac thrombosis involving left heart chambers remains elusive. Potential causes include a generalized thrombotic event secondary to a massive pulmonary embolism with a resultant low flow state in a hypercoagulable patient, or a right-to-left heart thrombus migration through a previously occult patent foramen ovale under the condition of increased right atrial pressures.

As illustrated, resection of renal cell carcinoma with inferior vena cava thrombosis can be complicated by tumor or thrombus dislodgment and cardiovascular collapse. Transesophageal echocardiography is indicated in such cases for confirming the diagnosis, allowing detection of thrombus migration, monitoring the effectiveness of resuscitation, and assisting surgical management.2,3

References