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How to proceed in the case of a tumour thrombus in the inferior vena cava with renal cell carcinoma



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ABSTRACT

Renal cell carcinoma accounts for about 3% of all malignant tumours in humans at adult age. The occurrence of a tumour thrombus in the inferior vena cava was recorded in 4% up to 10% of patients. In the period of 2006–2014 in the Department of Surgery of the Teaching Hospital and Faculty of Medicine in Pilsen we operated a total of 12 patients at the age from 44 to 80 for renal cell carcinoma with a tumour thrombus. Our results have proven clearly the benefit of nephrectomy with tumour thrombectomy in patients with renal cell carcinoma growing through the venous system.

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Introduction

Renal cell carcinoma accounts for about 3% of all malignant tumours in humans at adult age. In Europe, the annual incidence is approximately 2% with an increasing occurrence of small localized tumours due to incidental finding in the case of imaging examinations (ultrasound, computed tomography). Up to 60% of patients are asymptomatic. In the case of advanced cancer, typical three symptoms can be found – macrohematuria, lumbago and palpable tumour. Clear cell renal cell carcinoma represents approximately 75% of all renal tumours. Renal cell carcinoma spreads per continuitatem (both to the surrounding tissues and by angioinvasion into the renal vein and the inferior vena cava). The tumour metastasizes primarily hematogenous (lungs, bones, liver), lymphogenous rarely

(lumbar nodes). Therefore, CTA (computed tomography angiography), or, where applicable, MRA (magnetic resonance angiography), which, in addition to staging, confirms or excludes the presence of a tumour thrombus, is the most suitable method for the diagnostics. The occurrence of a tumour thrombus in the inferior vena cava (IVC) was recorded in 4% up to 10% of patients.

Group of patients

In the period of 2006–2014 in the Department of Surgery of the Teaching Hospital and Faculty of Medicine in Pilsen we operated a total of 12 patients at the age from 44 to 80 for renal cell carcinoma with a tumour thrombus. In 2 cases the tumour thrombus grew into the renal vein. In 10 cases the

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Table 1 – Group of patients.

Age (years)	TNM classification	Date of the operation	Tumour progression	Cause of death
55	T3bN0M0	6/2006	0	0
44	T3bN0M0	10/2007	Pulmonary metastases 2011	0
76	T3bN0M0	3/2009	0	0
65	T3bN0M0	4/2010	0	0
69	T3bN2M1	3/2011	N2M1	8/2012 ischemic stroke
64	T3bN0M1	5/2011	N0M1	0
68	T3bN0M0	10/2012	Pulmonary metastases 2013	0
70	T3cN0M0	12/2012	0	0
58	T3bN2M1	12/2012	N2M1	0
53	T3bN0M1	4/2013	N0M1	Pulmonary embolism
80	T3bN0M0	5/2013	0	0

tumour thrombus grew into the inferior vena cava, of which in one case supradiaphragmatically up to the level of the right atrium of the heart (Table 1).

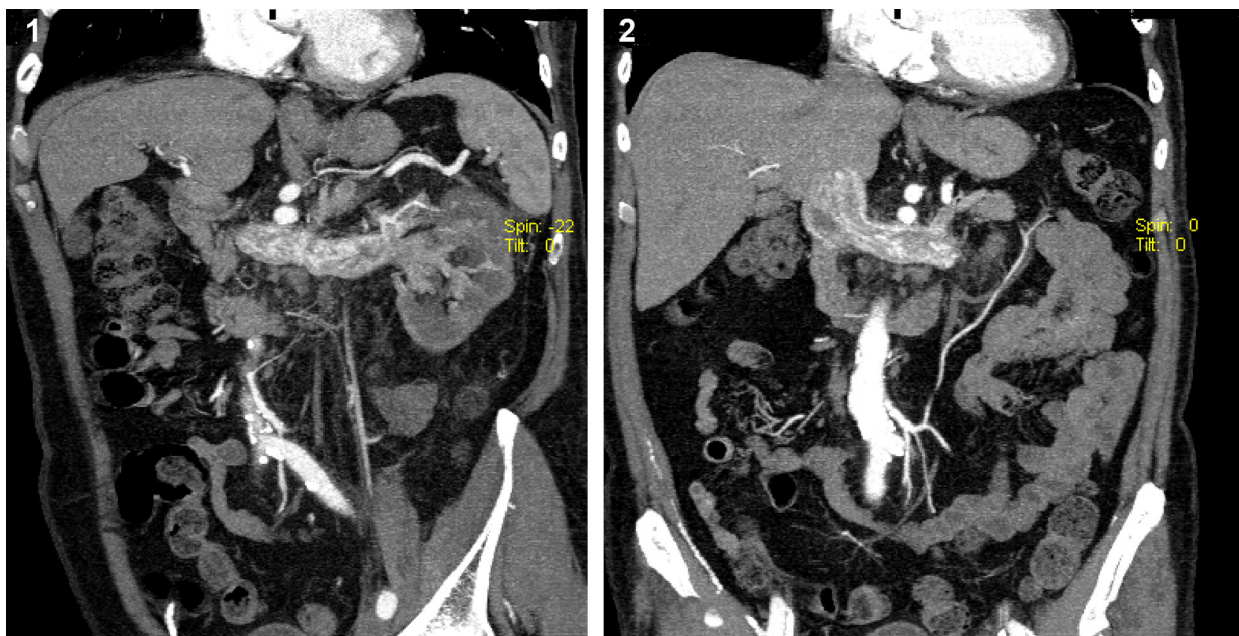
The correct diagnostics of the tumour thrombus ingrowth into venous system using CTA was determined in 11 cases and in these cases the surgery was conducted by a vascular surgeon. We always proceed very carefully and we try hard not to fragment the tumour thrombus and to eliminate pulmonary embolism. In 2 cases of tumour ingrowth into the renal vein the surgery was free of complications. In both cases the finding allowed to apply a wall clamp onto the inferior vena cava at the orifice of the renal vein and the execution of safe nephrectomy with direct suture of the inferior vena cava.

In the cases of the tumour thrombus spreading into the inferior vena cava subdiaphragmatically we always primarily apply a clamp above the proximal end of the tumour thrombus and the remaining part of the renal vein. After cavotomy at the orifice of the affected renal vein it is possible in most cases to remove the tumour mass which “floats” in the inferior vena cava and can be removed as a whole. After thrombectomy

(even in the case that it is necessary to execute a small excision at the orifice of the renal vein) we finish nephrectomy. In neither case we caused a significant narrowing of the inferior vena cava and had to implant a prosthesis of the inferior vena cava (Figs. 1–6).

We have had only one case of lethal pulmonary embolism with this procedure. The patient was a lady 62 years old with an advanced tumour of the left kidney with the spread of tumour thrombus up to the hepatic veins. The patient also had 2 distant metastases in the lungs. In addition to the tumour thrombus, a blood thrombus was present in the inferior vena cava distally from the renal veins and deep vein thrombosis was proven in the bed of the left lower extremity. Massive pulmonary embolism appeared as early as prior to handling the tumour itself and considering the tumour dissemination no cardiac surgery was indicated.

The case of the tumour thrombus spreading up to the level of the right atrium of the heart concerned a 70 years old lady with an advanced tumour in the right kidney with tumour duplicity in the sigmoid colon accompanied by recurring



Figs. 1 and 2 – A CTA image of renal cell carcinoma with a tumour thrombus growing through the left renal vein into the inferior vena cava.

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