



ISSN (E): 2277- 7695
ISSN (P): 2349-8242
NAAS Rating: 5.03
TPI 2019; 8(4): 998-1002
© 2019 TPI
www.thepharmajournal.com
Received: 05-02-2019
Accepted: 06-03-2019

Ihor Kobza

Department of surgery №2
Lviv National Medical
University, Lviv, 79000, Ukraine

Yuliya Mota

Department of surgery №2
Lviv National Medical
University, Lviv, 79000, Ukraine

Long-term results of surgical treatment of renal cell carcinoma, complicated with tumor venous thrombosis

Ihor Kobza and Yuliya Mota

Abstract

Aim: Analysis of the results of surgical treatment and cumulative survival of patients with renal cell carcinoma, complicated with tumor venous thrombosis.

Material and methods: 83 patients with renal cell carcinoma, complicated with tumor venous thrombosis, were observed at the Vascular surgery department of Lviv Regional Clinical Hospital for the period from 1993 to 2018: 58 (69.9%) men, 23 (27.7%) women, mean age – 58.2 ± 2.3 years; two children (2.4%) 5 and 9 years old. The preoperative instrumental examination included: ultrasound examination of the abdominal cavity, kidneys, computer or magnetic resonance imaging with intravenous contrast enhancement of the abdominal cavity, chest, excretory urography, echo-cardiography and venocavagrapy according to indications. Surgical treatment included radical nephrectomy in combination with thrombectomy from the inferior vena cava and right atrium. Kaplan-Meier method and log-rank test were used for survival analysis.

Results and discussion: The intraoperative mortality rate was 4.8%, causes of death - pulmonary embolism and hemorrhagic shock. The causes of postoperative lethality included: pulmonary embolism - in 1 (1.2%), hemorrhagic shock - in 2 (2.4%) cases. Long-term results were evaluated in 76 patients, the median follow-up was 53.2 months. Significantly higher survival rates were observed in patients with renal cell carcinoma with renal vein tumor thrombosis ($p < 0.05$). At the same time, there was no significant difference in survival among patients with renal cell carcinoma, complicated with tumor venous thrombosis, without and with metastases ($p = 0.20$). Regarding to the level of the tumor thrombus of the inferior vena cava there also was no significant difference in survival ($p = 0.29$).

Conclusions: Radical nephrectomy with thrombectomy from the inferior vena cava remains the method of choice in the treatment of patients with renal cell carcinoma, complicated with tumor venous thrombosis. The detailed and timely diagnosis of the prevalence of neoprocess, improvement of surgical tactics, effective prevention of thromboembolic and hemorrhagic complications allow to provide acceptable long-term survival rates for patients with renal cell carcinoma with venous invasion.

Keywords: Renal cell carcinoma, venous tumor thrombosis, surgical treatment, long-term results

Introduction

Tumor thrombosis of the inferior vena cava (IVC) at renal cell carcinoma (RCC) is observed in 4-10% of cases, in 0,4-1% vascular invasion reaches the level of the right atrium [10-13, 16, 17]. 5-year survival rate of patients with RCC, complicated with tumor venous thrombus, without distant metastases, is 40-69%, and intravenous invasion is not a prognostic criterion for dissemination of the tumor process in the postoperative period [2, 6, 9, 15]. The radical nephrectomy with thrombectomy from the IVC and right atrium remains the only effective method of treatment of these category of patients [1-7, 10, 11].

Aim

Analysis of the results of surgical treatment and cumulative survival of patients with RCC, complicated with tumor venous thrombosis.

Material and methods

83 patients with RCC, complicated with tumor venous thrombosis, were observed at the Vascular surgery department of Lviv Regional Clinical Hospital for the period from 1993 to 2018: 58 (69.9%) men, 23 (27.7%) women, mean age – 58.2 ± 2.3 years; two children (2.4%) 5 and 9 years old.

The preoperative instrumental examination included: ultrasound examination of the abdominal cavity, kidneys, computer or magnetic resonance imaging with intravenous contrast enhancement of the abdominal cavity, chest, excretory urography, echo-cardiography and venenography according to indications.

Correspondence

Ihor Kobza

Department of surgery №2
Lviv National Medical
University, Lviv, 79000, Ukraine

Using the modified classification of IVC thrombosis [11], Table 1 summarizes the distribution of patients according to the tumor venous thrombus level.

Table 1: The distribution of patients according to the tumor venous thrombus level

Tumor thrombus level	Total (n=83)	
	abs.	%
Renal vein	22	26.5
Cava-renal segment	12	14.5
Infrahepatic IVC	13	15.7
Retrohepatic IVC	28	33.7
IIIa	10	12.1
IIIb	6	7.2
IIIc	5	6.0
IIId	7	8.4
Right atrium	8	9.6
Total	83	100.0

According to Table 1, patients with infrahepatic tumor thrombus level have been prevailed (56.7%). The overall rate of "high" tumor thrombi (retrohepatic IVC and right atrium) was 43.3%.

Surgical treatment included radical nephrectomy in combination with thrombectomy from the inferior vena cava and right atrium. Depending on the level of tumor thrombus extension different types of surgical approaches were used, in particular: subcostal approach in 13 (15.7%), transverse laparotomy in 8 (9.6%), median laparotomy in 20 (24.1%), "Mercedes" approach in 20 (24.1%) cases. At supradiaphragmatic IVC tumor thrombosis thoracotomy (6 (7.2%)) and sternotomy (16 (19.3%)) were used. 6 (7.2%) patients had been operated using cardio-pulmonary bypass.

In 11 (13.3%) patients for pulmonary embolism prevention in the preoperative period transcatheter retrograde implantation of IVC filters had been performed between Th9-Th12 depending on the level of tumor thrombus according to veno-cavagraphy. Subsequently, the intraoperative removal of the IVC filter didn't complicate the course of the operation. The mean blood loss was 1020 ml (500 - 3900 ml). The using of Cell-Saver system has significantly reduced the need for donor blood.

Kaplan-Meier method was used to evaluate the long-term

survival of patients with RCC, complicated with tumor venous thrombosis.

Results and discussion

According to various authors, the frequency of complications after nephrectomy with thrombectomy from the IVC and right atrium reaches 9.8-45.5% [1, 3, 14, 16], and postoperative lethality is 3.0 -16.0% [1, 3, 8, 17].

According to our observations, the intraoperative mortality rate was 4.8% (4 patients), the causes of death - pulmonary embolism and hemorrhagic shock. The postoperative complications are summarized in Table 2. The causes of postoperative lethality included: pulmonary embolism in 1 (1.2%) and hemorrhagic shock in 2 (2.4%) cases.

Table 2: Postoperative complications among 83 patients with RCC and tumor venous thrombosis

Complication	Total (n=83)	
	abs.	%
Pulmonary embolism	5	6.0
Acute renal failure	13	15.7
Acute hepatic failure	5	6.0
Acute adrenal failure	2	2.4
Posthemorrhagic anemia (<100 g/L)	25	30.1
Deep vein thrombosis	3	3.6
Pneumothorax	2	2.4
Wound infection	3	3.6
Stroke	1	1.2
Ileus	2	2.4

The morphological study confirmed the conventional (clear cell) RCC in 60 (72.3%), granular-cellular in 12 (14.5%), mixed in 7 (8.4%) cases, Bellini carcinoma ducts has been detected in 1 (1.2%) and nephroblastoma in 3 (3.6%) cases. The regional lymph nodes metastases were observed in 25 (30.1%) and distant metastases in 10 (12.1%) patients, most often in the lungs (7 (70%) patients).

Long-term results were evaluated in 76 patients, the median follow-up was 53.2 months.

Thus, the cumulative 2-, 5- and 10-year survival among 76 patients with RCC, complicated with venous tumor thrombosis was 64.7%, 45.1% and 33.6% respectively. The median survival rate was 45.9 months (Fig.1).

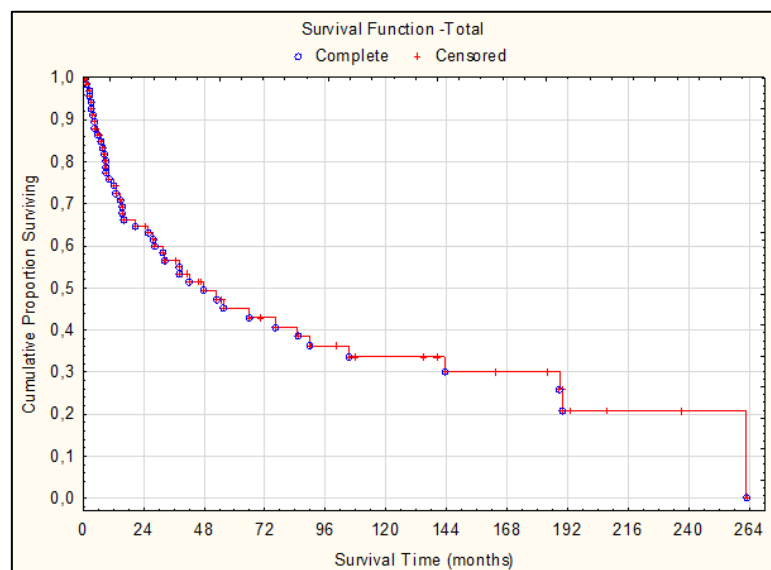


Fig 1: Cumulative survival among 76 patients with RCC, complicated with venous invasion

Separately we analyzed the survival rates in 55 patients, with tumor thrombosis of the IVC, and 21 patients with tumor thrombosis of the renal vein (Fig.2).

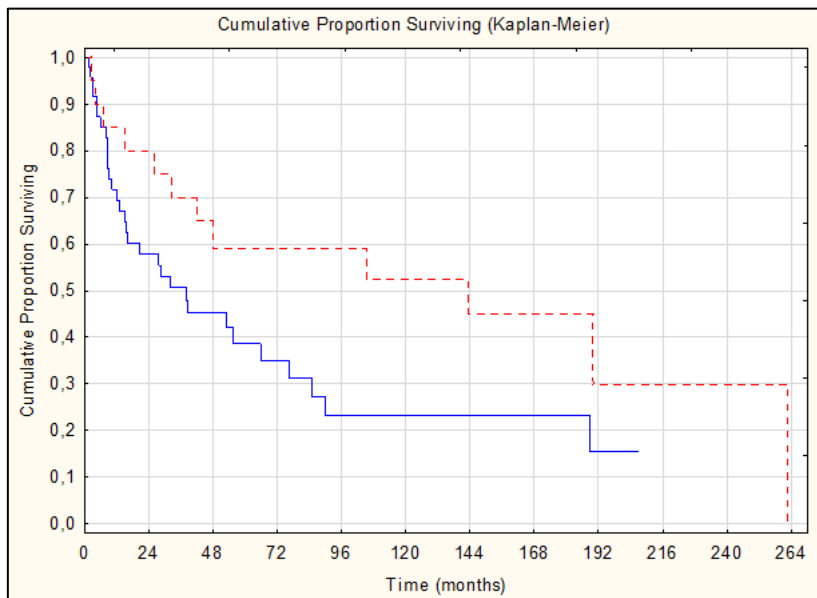


Fig 2: — Cumulative survival of patients with RCC involving the IVC; - - - Cumulative survival of patients with RCC and renal vein thrombosis

As we can see, the cumulative 2-, 5- and 10-year survival rates of patients with renal vein tumor thrombosis (80.0%, 59.1%, 52.5%) were significantly higher compared to patients with IVC tumor thrombosis (57.8%, 38.5%, 23.4%) ($p < 0.05$). The median survival rate for patients with RCC, complicated with IVC tumor thrombosis, was 33.3 months, whereas for

patients with RCC and renal vein tumor thrombosis - 118.2 months.

At the same time, there was no significant difference in survival among patients with RCC, complicated with tumor venous thrombosis, without and with metastases ($p = 0.20$), (Fig. 3).

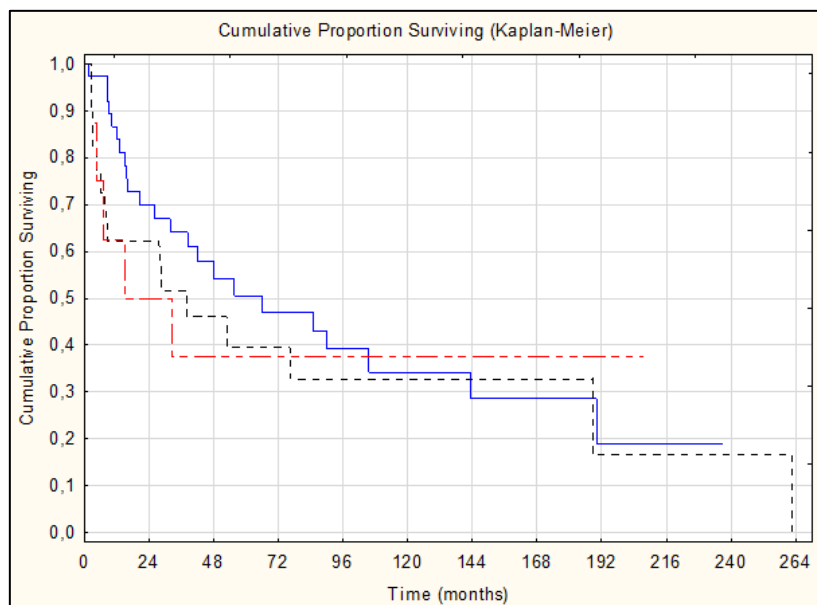


Fig 3: — Survival among patients with RCC, complicated with venous thrombosis: group without metastases; - - - M0 group; ····· M1 group

Regarding to the level of the tumor thrombus of the IVC there also was no significant difference in survival ($p = 0.29$), (Fig. 4).

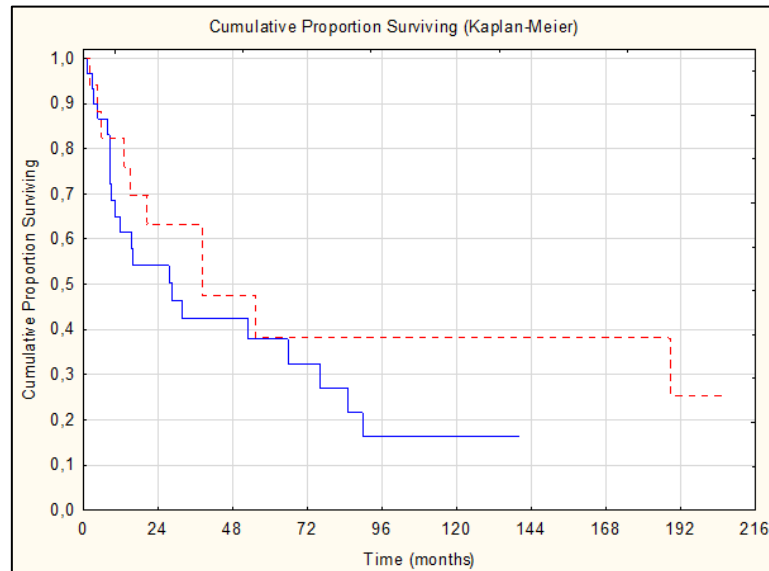


Fig 4: — Survival among: patients with retrohepatic and intraatrial venous tumor thrombosis; - - - patients with cava-renal and infrahepatic level of venous tumor thrombosis

So, significantly higher survival rates were observed in patients with RCC with renal vein tumor thrombosis ($p < 0.05$). At the same time, there was no significant difference in survival among patients with RCC, complicated with tumor venous thrombosis, without and with metastases ($p = 0.20$). Regarding to the level of the tumor thrombus of the IVC there also was no significant difference in survival ($p = 0.29$), what is confirmed by the data of literary sources [2, 9, 17].

Conclusions

Radical nephrectomy with thrombectomy from the IVC remains the method of choice in treatment of patients with RCC, complicated with tumor venous thrombosis. The detailed and timely diagnosis of the prevalence of neoprocess, improvement of surgical tactics, effective prevention of thromboembolic and hemorrhagic complications allow to provide acceptable survival rates for patients with RCC with venous invasion.

References

- Atduev VA, Amoev ZV, Danilov AA, Bel'skiy VA, Ledyayev DS, Rykhtik PI *et al.* Surgical treatment of kidney cancer with extended inferior vena cava thrombosis: complications and long-term results. *Oncourology*. 2017; 1:37-44.
- Davydov MI, Matveev VB, Dzemeshevich SL, Volkova MI, Figurin KM, Feoktistov PI *et al.* Surgical treatment of renal cell carcinoma with tumor venous thrombosis in patients without distant metastases. *Clin. Experiment. Surg. Petrovsky J*. 2015; 4:18-27.
- Davydov MI, Matveev VB, Volkova MI, Zhuzhginova OV, Lomidze SV, Feoktistov PI *et al.* Predictors of the immediate results of thrombectomy in kidney cancer patients with venous tumor thrombosis. *Oncourology*. 2014; 3:31-39.
- Rusin VI, Korsak VV, Boiko SO, Popovych YaM. Surgical treatment of renal cell carcinoma with internally venous dissemination and implantation of thrombus in intra vena cava inferior tissue. *Hospital Surgery*. 2015; 2:5-8.
- Rusin VI, Korsak VV, Popovich YM, Boiko SO. Choice of surgical access depending on the level of thrombotic lesion of inferior vena cava. *Hospital Surgery. The journal named after L. Ya. Kovalchuk*. 2016; 2(74):17-22.
- Stakhovsky EO, Burlaka AA, Voilenko OA, Vitruck YuV, Kolesnik OO. Renal cell carcinoma and inferior vena cava thrombosis. *Oncology*. 2017; 19(3):202-205.
- Shchukin DV, Lesovoy VN, Garagatiy IA, Polyakov NN, Khareba GG. Abdominal transdiaphragmatic extrapericardial surgical access to supradiaphragmatic part of vena cava inferior in patients, operated for renal-cell cancer. *Clinical surgery*. 2015; 4:59-62.
- Armstrong PA, Back MR, Shames ML, Bailey CJ, Kim T, Lawindy SM *et al.* Outcomes after inferior vena cava thrombectomy and reconstruction for advanced renal cell carcinoma with tumor thrombus. *J Vasc Surg Venous Lymphat Disord*. 2014; 2(4):368-376.
- Ciancio G, Manoharan M, Katkooori D, De Los Santos R, Soloway MS. Long-term survival in patients undergoing radical nephrectomy and inferior vena cava thrombectomy: single-center experience. *European urology*. 2010; 57(4):667-672.
- Haidar GM, Hicks TD, El-Sayed HF, Davies MG. Treatment options and outcomes for caval thrombectomy and resection for renal cell carcinoma. *J Vasc Surg Venous Lymphat Disord*. 2017; 5(3):430-436.
- Hevia V, Ciancio G, Gomez V, Álvarez S, Díez-Nicolás V, Burgos FJ. Surgical technique for the treatment of renal cell carcinoma with inferior vena cava tumor thrombus: tips, tricks and oncological results. *Spreinger Plus*. 2017; 5:132. DOI 10.1186/s40064-016-1825-1.
- Martínez-Salamanca JI, Huang WC, Millán I, Bertini R, Bianco FJ, Carballido JA *et al.* Prognostic impact of the 2009 UICC/AJCC TNM staging system for renal cell carcinoma with venous extension. *European urology*. 2011; 59(1):120-127.
- Miyake H, Sugiyama T, Aki R, Matsushita Y, Tamura K, Motoyama D *et al.* Oncological outcomes after cytoreductive nephrectomy for patients with metastatic renal cell carcinoma with inferior vena caval tumor thrombus. *Int J Clin Oncol*. 2018; 23(3):553-558.
- Nini A, Capitano U, Larcher A, Dell'Oglio P, Dehò

- F, Suardi N *et al.* Perioperative and oncologic outcomes of nephrectomy and caval thrombectomy using extracorporeal circulation and deep hypothermic circulatory arrest for renal cell carcinoma invading the supradiaphragmatic inferior vena cava and/or right atrium. *European Urology*. 2018; 73(5):793-799.
15. Pouliot F, Shuch B, LaRochelle JC, Pantuck A, Belldgrun AS. Contemporary management of renal tumors with venous tumor thrombus. *The Journal of urology*. 2010; 184(3):833-841.
16. Vergho DC, Loeser A, Kocot A, Spahn M, Riedmiller H. Tumor thrombus of inferior vena cava in patients with renal cell carcinoma – clinical and oncological outcome of 50 patients after surgery. *BMS Research Notes*. 2012; 5:5.
17. Wagner B, Patard JJ, Mejean A, Bensalah K, Verhoest G, Zigeuner R *et al.* Prognostic value of renal vein and inferior vena cava involvement in renal cell carcinoma. *Eur Urol*. 2009; 55(2):452-459.