

# Presence of Bland Thrombus is a Negative Indicator for Cancer Specific Survival in Patients Undergoing Nephrectomy for Kidney Tumors with Venous Tumor Thrombus

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## Background

Kidney and renal pelvis tumors accounted for approximately 3.8% of new cancer cases and 2.4% of cancer related deaths in the United States in 2014. Renal cell carcinoma (RCC) comprises a majority of these neoplasms arising in the kidney and tumor extension into the renal vein is a common complication seen in approximately 5% of RCC cases.

Many studies have already sought to determine pre-operative predictive values for long term survival in patients who undergo caval thrombectomy, but these have primarily focused on markers such as TNM stage, thrombus level, tumor thrombus volume, tumor thrombus consistency, caval diameter, caval occlusion, ECOG status and pre-operative electrolyte counts.

To our knowledge, no reputable studies have evaluated presence of bland thrombus as an independent prognostic factor in determining long term survival in patients with renal cell carcinoma and venous tumor extension who undergo caval thrombectomy.

## Methods

This is a multi-institutional, IRB approved, retrospective review in which nephrectomy databases from multiple high volume tertiary care centers were reviewed for identification of RCC patients with extension into the renal vein with presence and absence bland thrombus as identified on preoperative radiographic imaging, intraoperatively or upon final pathologic evaluation.

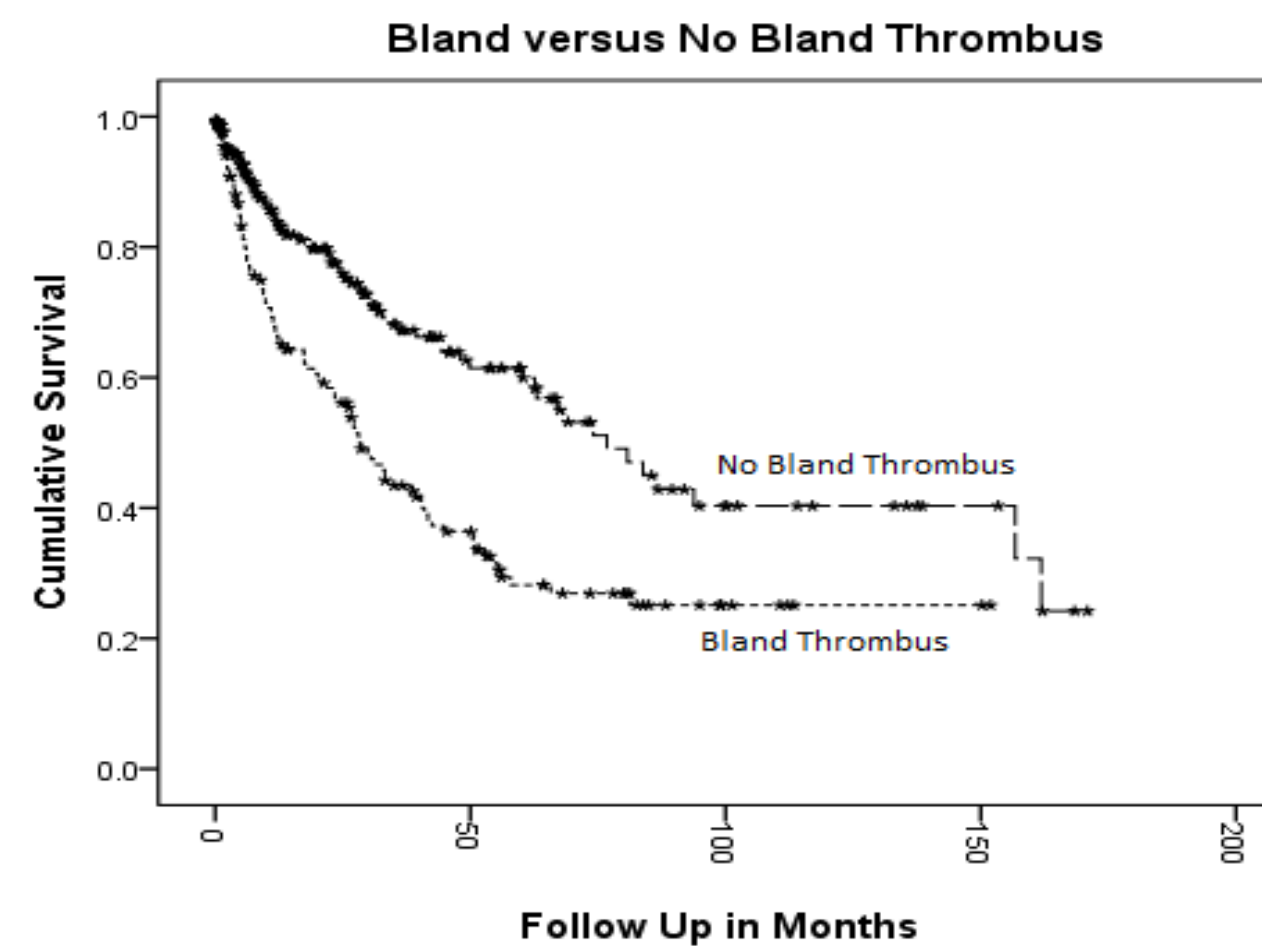
Patients were excluded due to incomplete information, non-parenchymal origin tumors or deficient follow-up data. Kaplan Meier survival curves and Cox Regression analysis were performed on SPSS v22.

**Table 1: Baseline Patient Characteristics**

Item	Bland Thrombus (163 Patients)	No Bland Thrombus (225 Patients)	Significance for Difference
Mean Age (IQR)	62.2 (54.6-71)	61.1 (52.0-70.0)	0.326
Percent Smoking	33%	42%	0.494
ECOG 0	9.5%	34.1%	0.042
ECOG 1	57.1%	50.5%	
ECOG 2	23.8%	11.5%	
ECOG 3	9.5%	3.3%	
Novick Thrombus Level 1	4.8%	0.4%	<0.001
Novick Thrombus Level 2	38.1%	11.6%	
Novick Thrombus Level 3	28.6%	47.1%	
Novick Thrombus Level 4	28.6%	23.1%	

**Table 1: Characteristics for patients with and without presence of bland thrombus.**

**Figure 1: Kaplan-Meier Survival Curves**



**Figure 1: Kaplan-Meier survival curves for patients with presence of bland thrombus and absence of bland thrombus.**

**Table 2: Univariate Cox Regression**

Item	Significance
Age	0.52
Histologic Subtype	0.069
Sarcomatoid Differentiation	0.60
Tumor Stage	<0.001
Novick Thrombus Level	<0.001
Positive Margin Status	<0.001
Smoking Status	0.070
Lymphovascular Invasion	0.552
Bland Thrombus	<0.001

**Table 2: Analysis of overall factors associated with decreased cancer-specific survival.**

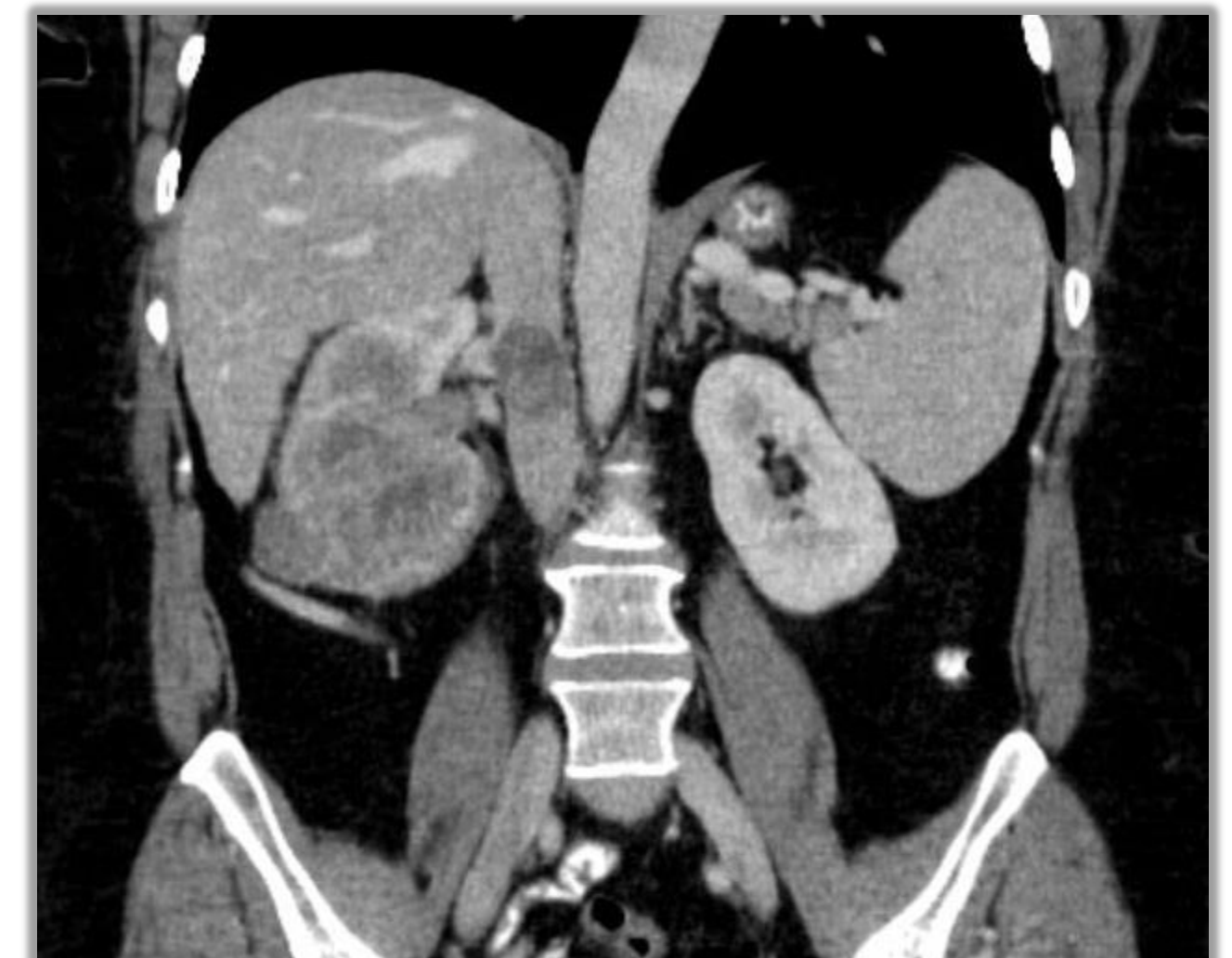
## Results

388 patients were identified including 225 patients without bland thrombus and 163 with bland thrombus. Median patient age was 62 and median ECOG performance status was 1. Median survival time for tumors without bland thrombus was 76.7 months (95% CI: 57.7 – 95.8) versus 28.3 months (95% CI: 23.0 – 33.5) for those with bland thrombus. Bland thrombus was not associated with histologic subtype ( $p = 0.069$ ) or sarcomatoid differentiation ( $p = 0.60$ ) and was highly associated with tumor stage ( $p < 0.001$ ), level of tumor thrombus ( $p < 0.001$ ) and positive margin status ( $p < 0.001$ ). Presence of bland thrombus was associated with decreased cancer-specific survival ( $p < 0.001$ ) with a hazard ratio of 2.03 (95% CI: 1.49 - 2.77) for death-of-disease.

## Conclusion

Pre-operative radiographic identification of Bland Thrombus in patients with RCC is a negative predictive factor for cancer-specific survival in those who undergo caval thrombectomy. Further studies are needed to confirm this conclusion and ascertain whether this is a modifiable risk factor.

**Figure 2: CT Imaging**



**Image 1: Example CT image showing a patient with RCC with caval extension and presence of bland thrombus.**