



The 65th ASH Annual Meeting Abstracts

POSTER ABSTRACTS

904. OUTCOMES RESEARCH-NON-MALIGNANT CONDITIONS

Outcomes of Catheter-Based Therapy for Cancer-Associated Intermediate or High-Risk Pulmonary EmbolismOrly Leiva, MD¹, Eric H Yang, MD², Rachel P. Rosovsky, MD³, Carlos Alviar, MD¹, Sripal Bangalore, MD¹¹New York University Grossman School of Medicine, New York City, NY²Cardio-Oncology Program, University of California at Los Angeles, Los Angeles, CA³Division of Hematology & Oncology, Department of Medicine, Massachusetts General Hospital, Boston, MA

Background: Pulmonary embolism (PE) is a well-known complication of cancer and is associated with significant morbidity and mortality. The standard of care for the treatment of PE is anticoagulation and systemic thrombolysis for high-risk PE. However, both carry risk of bleeding, and patients with cancer are particularly at higher risk of both bleeding and thrombotic complications. The development of catheter-based therapies (CBT) has provided an alternative reperfusion therapy for patients with high-risk and select intermediate risk PE patients. However, despite the increased prevalence of PE, patients with cancer are often excluded from clinical trials of invasive medical devices, including CBT for PE. Therefore, we investigated outcomes of patients with cancer hospitalized for intermediate or high-risk PE treated with or without CBT.

Methods: This was a retrospective cohort analysis of the National Readmission Database (NRD) of adult patients with a primary diagnosis of intermediate or high-risk PE from 2017 and 2018 with a history of cancer, which was identified using ICD-10 codes. High-risk PE was defined as PE with hemodynamic instability (either cardiac arrest, cardiogenic shock, or vasopressor use). Intermediate-risk PE was defined as PE with signs of right ventricular strain (type 2 myocardial infarction or cor pulmonale) without hemodynamic instability. Primary outcome was in-hospital mortality. Secondary outcomes were in-hospital major bleeding (composite of gastrointestinal, intracranial, and post-procedural bleeding), and 90-day any-cause, VTE-related, and bleeding-related readmissions. Propensity scores (PS) for estimating probability of CBT were calculated using non-parsimonious multivariable logistic regression that included all baseline patient characteristics examined. Inverse-probability treatment weighting (IPTW) was utilized to adjust for potential confounders. Patients treated with CBT were compared to those without and standardized mean difference (SMD) was calculated for variables before and after IPTW. Imbalances between groups were significant if SMD for any given covariable was ≥ 0.10 . Hazard ratios (HR) were estimated for 90-day readmission outcomes using Cox proportional hazards regression, and odds ratio (OR) were calculated for estimating in-hospital outcomes using logistic regression.

Results: 3,333 patients were identified of which 388 (11.6%) were treated with CBT. Prior to IPTW, patients treated with CBT were younger (mean age 66.3 vs 67.6 years) and less likely to have metastatic cancer (43.3% vs 50.3%), Khorana high or intermediate risk cancer type (40.5% vs 49.4%) or high-risk PE (34.5% vs 46.3%), Table 1. After IPTW, baseline characteristics were well balanced between groups. After IPTW, CBT was associated with lower risk of in-hospital death (23.3% vs 28.3%, OR 0.77, 95% CI 0.69 - 0.86) but higher risk of in-hospital bleeding (16.4% vs 13.7%, OR 2.34, 95% CI 2.11 - 2.60) which was driven by post-procedure bleeding (12.5% vs 9.2%, OR 1.40, 95% CI 1.20 - 1.64). CBT was also associated with lower 90-day any-cause (HR 0.88, 95% CI 0.79 - 0.98) and VTE-related (HR 0.54, 95% CI 0.35 - 0.83) but not bleeding-related (HR 0.69, 95% CI 0.34 - 1.40) readmissions, Figure 1.

Conclusions: Patients with cancer admitted with intermediate or high-risk PE have high rates of in-hospital death and bleeding. Treatment with CBT was associated with lower in-hospital death and 90-day any-cause and VTE-related readmissions at the cost of increased in-hospital bleeding driven by post-procedural bleeding. Prospective studies and trials of CBT in PE should include patients with cancer and further investigation is warranted to confirm our findings.

Disclosures Rosovsky: *Penumbra:* Consultancy, Other: National Lead Investigator for STORM PE; *Janssen:* Consultancy, Other: Research funding is to my institution, Research Funding; *Abbott:* Consultancy; *Dova:* Consultancy; *BMS:* Consultancy; *Pulmonary Embolism Response Team:* Membership on an entity's Board of Directors or advisory committees, Other: President-Elect; *Inari:* Consultancy.

Table: Patient Baseline Characteristics at Index Hospitalization Before and After IPTW

	Unweighted			Inverse Probability Treatment Weighted		
	No CBT N = 2,945	CBT N = 388	SMD	No CBT	CBT	SMD
Age, years (SD)	67.6 (12.3)	66.3 (11.3)	0.111	67.4 (12.4)	66.6 (10.9)	0.069
Female Sex, N (%)	1,551 (52.7)	186 (47.6)	0.095	52.1%	51.4%	0.014
Cancer Types, N (%)						
Solid Cancer	2,506 (85.1)	328 (84.5)	0.016	85.0%	85.1%	0.003
Hematologic Cancer	495 (16.8)	69 (17.8)	0.026	16.9%	17.1%	0.005
Metastatic Cancer	1,481 (50.3)	168 (43.3)	0.140	49.5%	50.8%	0.026
Brain Tumor or Metastasis	395 (13.4)	32 (8.5)	0.167	12.8%	14.0%	0.035
Khorana High or Intermediate Risk Cancer	1,455 (49.4)	157 (40.5)	0.180	48.4%	46.7%	0.034
Co-Morbidities, N (%)						
Hypertension	1,783 (60.5)	232 (59.8)	0.015	60.5%	59.4%	0.022
Prior VTE	339 (11.5)	49 (12.6)	0.034	11.7%	11.3%	0.013
Heart Failure	705 (23.9)	93 (24.0)	0.001	24.0%	27.4%	0.078
Diabetes	751 (25.5)	90 (23.2)	0.054	25.2%	24.3%	0.021
CAD	958 (32.5)	133 (34.3)	0.037	32.7%	31.8%	0.019
Smoking	1,129 (38.3)	144 (37.1)	0.025	38.2%	37.9%	0.006
Peripheral Vascular Disease	87 (3.0)	10 (2.6)	0.023	2.9%	2.6%	0.018
Chronic Kidney Disease	442 (15.0)	49 (12.6)	0.069	14.7%	12.8%	0.055
Liver disease	270 (9.2)	33 (8.5)	0.023	9.1%	8.7%	0.014
Anemia	1,120 (38.0)	173 (44.6)	0.133	38.8%	39.1%	0.006
Thrombocytopenia	395 (13.4)	63 (16.2)	0.080	13.7%	13.6%	0.003
Long-term Anti-Coagulation	347 (11.8)	39 (10.1)	0.056	11.6%	11.0%	0.019
Long-term Anti-Platelet	333 (11.3)	52 (13.4)	0.064	11.6%	11.3%	0.009
DNR	944 (32.1)	68 (17.5)	0.341	30.4%	29.0%	0.031
Palliative Care	638 (21.7)	38 (9.8)	0.330	20.3%	18.6%	0.043
Hospitalization Characteristics, N (%)						
High Risk PE	1,363 (46.3)	134 (34.5)	0.241	45.0%	44.8%	0.004
DVT	1,363 (46.3)	219 (56.4)	0.204	47.5%	49.7%	0.044
Respiratory Failure	1,649 (56.0)	221 (57.0)	0.019	56.1%	57.6%	0.030
Mechanical Ventilation	724 (24.6)	70 (18.0)	0.160	23.9%	24.3%	0.009
ECMO	11 (0.4)	4 (1.0)	0.079	0.5%	0.6%	0.014
Systemic Thrombolysis	397 (13.5)	32 (8.2)	0.169	12.9%	15.2%	0.066
Large or Medium Hospital	2,541 (86.3)	350 (90.2)	0.122	86.7%	87.5%	0.024
Urban Teaching Hospital	2,292 (77.8)	319 (82.2)	0.110	78.3%	76.9%	0.034
Medicare or Medicaid	2,085 (70.8)	270 (69.6)	0.026	70.6%	68.9%	0.037
Lowest Quartile Zip Code for Income	708 (24.0)	88 (22.7)	0.032	23.9%	23.3%	0.014

CAD, coronary artery disease; CBT, catheter-based therapy; DNR, do-not-resuscitate; DVT, deep vein thrombosis; ECMO, extracorporeal membrane oxygenation; IPTW, inverse-probability treatment weighting; PE, pulmonary embolism; SD, standard deviation; SMD, standardized mean difference; VTE, venous thromboembolism

Figure: Outcomes After IPTW

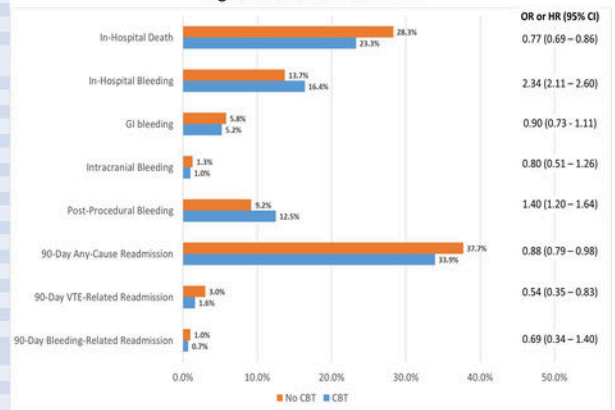


Figure 1

<https://doi.org/10.1182/blood-2023-187947>

Downloaded from http://ashpublications.net/blood/article-pdf/142/Supplement_1/2361/2181930/blood-8963-main.pdf by guest on 02 June 2024