Optimizing Pulmonary Embolism Response Team Functionality: Outcomes of Mechanical Thrombectomy by Interventional Radiology and Vascular Surgery

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Background

- Acute pulmonary embolism (PE) affects upwards of 350,000 Americans annually and has devastating morbidity and mortality.[1]
- Multispecialty collaboration in a PERT varies by institution. Procedure sharing between two services may increase specialty and individual physician buy-in to PERTs by decreasing on-call time.[3]
- At Barnes Jewish Hospital, Washington University in St. Louis, IR and vascular surgery (VS) perform mechanical thrombectomy (MT) for PE on alternating days.
- Aim of this study was to investigate differences in MT outcomes among IR and VS who participate in the institutional PERT.

Methods

- ***Patient Selection:*** Intermediate-high risk or high-risk PE patient and received institutional PERT consultation and underwent MT over a 3.5-year period.
- ***Cohorts:*** MT from IR and MT from VS.
- ***Treatment Allocation***: Based on clot burden, comorbidities, bleeding risk, thrombolytic contraindications, hemodynamic status, right ventricular (RV) dysfunction, clinical deterioration and institutional expertise. No strict metrics-based algorithm.
- ***Procedure:*** MT with FlowTriever (Inari Medical, Irvine, CA) or Indigo Aspiration catheter (Penumbra, Alameda, CA)
- ***Outcomes:*** 30-day all-cause mortality, time-to-intervention, procedural room time, complication, readmission, and bleeding rates.
- ***Statistical Analysis:*** Chi-square analyses and odds ratios.

Patient and Procedural Characteristics

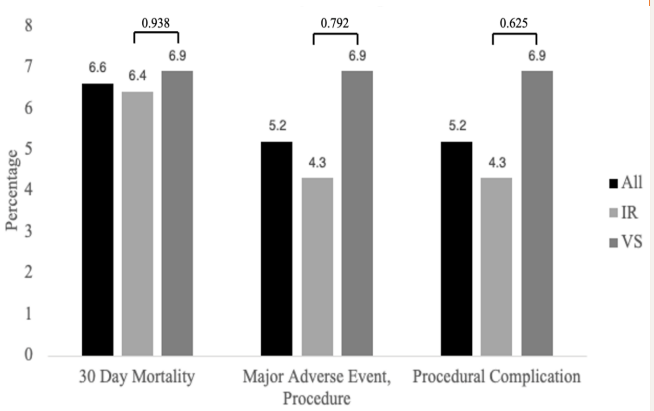
Patient Baseline Characteristics

Characteristic	All Patients (n=76)	IR (n=47)	VS (n=29)	p-value
Age	57.9 (±15.2)	58.8(±15.4)	56.5 (±15)	0.652
Race (n)				0.147
White	53.9% (41)	48.9% (23)	70.0% (20)	
Black	40.8% (31)	46.8% (22)	27.6% (8)	
Asian	1.3% (1)	2.1% (1)	0% (0)	
Pacific Islander	1.3% (1)	2.1% (1)	0% (0)	
American Indian	1.3% (1)	0% (0)	3.4% (1)	
BMI	34.94±9.4	35.83±9.6	33.63±9.3	0.339
PE Severity (n)				0.794
High-Risk	46.1% (35)	53.2% (25)	44.8% (13)	
Intermediate-High Risk	53.9% (41)	46.8% (22)	55.2% (16)	
Location of PE (n)				0.442
Saddle	68.4% (52)	72.3% (34)	62.1% (18)	
DVT Presence	73.7% (56)	68.1% (32)	82.8% (24)	0.950
Comorbidities (n)				
HTN	56.2% (43)	61.7% (29)	48.2% (14)	0.280
DM	27.4% (21)	29.7% (14)	24.1% (7)	0.926
CVA	2.6% (2)	4.3% (2)	0% (0)	0.694
COPD	5.3% (4)	6.4% (3)	3.4% (1)	0.971
Active Malignancy	23.7% (18)	23.4% (11)	24.1% (7)	>0.99
2+ Comorbidities	39.5% (30)	42.6% (20)	34.5% (10)	0.622
Charlson Comorbidity Score	3 (+/-2.8)	3.27 (+/-2.9)	2.8 (+/-2.7)	0.476

Procedural Characteristics

	All Patients (n=76)	IR (n=47)	VS (n=29)	p-value
Major Adverse Events	5.2% (4)	4.3% (2)	6.9% (2)	0.792
Procedural Complications	5.2% (4)	4.3% (2)	6.9% (2)	0.792
Anesthesia Type				0.234
Monitored Anesthesia Care	77.6% (59)	82.3% (39)	68.9% (20)	
General Anesthesia	21% (16)	14.9% (7)	27.6% (8)	
Time to Intervention	129.4±171	101.9±136	176.9±214	0.076
Time in Room	181.6±57	169±46.6	202.6±66.7	0.017*

Patient Mortality and Complications



Conclusion

- Only mean in-room time was statistically different between services (33 minutes shorter for IR, p=0.017).
- 6.6% mortality rate reflects higher rates of malignancy, saddle PE, and other factors associated with poor outcome in acute PE compared to the FLASH registry.[4]
- This model allows both services to share on-call time for emergent PE thrombectomy.
- Sharing call responsibilities between IR and VS within this PERT does not compromise patient outcomes.
- May increase physician participation in an already existing PERT or facilitate the development of a new PERT.

References

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