Title: Factors associated with overall survival after thrombectomy for high and intermediate-risk pulmonary embolism

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Purpose: To assess survival after embolectomy for high and intermediate-risk pulmonary embolism (PE) and factors associated with higher mortality

Materials and Methods: 257 patients with high and intermediate-risk pulmonary embolism (PE) who underwent mechanical thrombectomy using FlowTriever system between July 2019 and November 2021 were enrolled in this retrospective review. Data were analyzed using Stata MP 17.0 with Kaplan-Meier method and Cox regression survival analysis. Type one error was set at 0.05.

Results: Patients' mean age was 62 (range: 16-97) years, and 51% were male. 20% had previous history of deep venous thrombosis (DVT) or PE, and 81% had concomitant DVT at presentation. Twenty (8%) patients were COVID positive, and 21%, 28%, 24%, 12% and 15% of patients presented with Pulmonary Embolism Severity Index (PESI) class 1-5, respectively. Average pre- and post-thrombectomy pulmonary artery pressure was 50/21 (mean PAP: 32) and 37/16 (mean PAP: 24) mmHg; average decrease in PAP was 13/5 (mean PAP: 8) mmHg (P<0.0001 for all comparisons). Mean estimated blood loss was 412 (range: 5 – 1000) ml, and 30% received inferior vena cava (IVC) filter. Immediate complication occurred in 4 (2%) patients including cardiovascular collapse, anaphylaxis and hemoptysis. Among those who presented from ICU (n=48), 15% did not require ICU level of care after procedure. Median post-embolectomy length of hospital stay was 4 (0-42) days. All-cause readmission occurred in 14% in an average of 4 months, with venous thromboembolism (VTE) readmission in a total of 5 (2%) patients in an average of 5 months. Patients were followed for a mean duration of 471 (range: 0 – 1111) days. Post-procedure mortality rate was 14%, all from causes unrelated to the procedure. Total at-risk study duration was 331.4 person-year, with incidence rate of post-procedure all-cause mortality being 0.3 per 1000 person-years. In multivariate analysis, factors (hazard ratio, P value) associated with higher post-procedure mortality were: high or very high PESI class (4.17, 0.002), post-embolectomy mean PAP (1.05, 0.025) and pre-embolectomy ICU stay (6.05, 0.021).

Conclusion: FlowTriever-assisted embolectomy is safe and effective in reducing pulmonary arterial pressure in high and intermediate-risk pulmonary embolism. High or very high PESI class, pre-embolectomy ICU stay and post-embolectomy mean pulmonary arterial pressure are associated with higher post-procedure mortality.