Mechanical thrombectomy in intermediate- and high-risk acute pulmonary embolism: haemodynamic outcome at 3 months

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Background: Haemodynamic data months after mechanical thrombectomy for pulmonary embolism (PE) are scarce.

Aims: To assess the haemodynamic effects of mechanical thrombectomy in acute PE with right heart overload.

Methods: In this prospective, open-label study, patients with acute symptomatic, computed tomography-documented PE with signs of right heart overload underwent mechanical thrombectomy using the FlowTriever System. Right heart catheterization was performed immediately before and after thrombectomy and after three months. Transthoracic echocardiography was performed before thrombectomy, discharge, and at three months. This analysis was done after the first 20 patients completed their three months of follow-up.

Results: Twenty-nine patients (34% female) underwent mechanical thrombectomy, of which 20 completed three months follow-up with right heart catheterization. Most patients (17%) were at high or intermediate-high (76%) risk and had bilateral pulmonary embolisms (79%). Before thrombectomy, systolic pulmonary arterial pressure (sPAP) was severely elevated (mean 51.3 ± 11.6 mmHg). Mean sPAP dropped by -15.0 mmHg (95% confidence interval [CI]: -18.9 to -11.0; p < 0.001) immediately following the procedure and continued to decrease from post-thrombectomy to three months (-6.4 mmHg, 95% CI: -10.0 to -2.9; p = 0.002) (Figure). Right ventricle (RV)/left ventricle (LV) ratio immediately reduced within two days by -0.37 (95% CI: -0.47 to -0.27; p < 0.001). The proportion of patients with a TAPSE/sPAP ratio < 0.31 mm/mmHg decreased from 28% at baseline to 0% before discharge and at three months (p = 0.007). There were no procedure-related major adverse events.

Conclusions: Mechanical thrombectomy for acute PE was safe and immediately reduced PAP and improved right heart function. The reduction in PAP was maintained at three months follow-up.