Journal Article

Catheter-directed mechanical aspiration thrombectomy in a real-world pulmonary embolism population

This study evaluated real-world outcomes of catheter directed mechanical aspiration thrombectomy (CDMT) using the 8F Indigo system in 110 patients with intermediate-high risk (71.8%) and high-risk (28.2%) acute pulmonary embolism across four centers in Poland. The cohort was high acuity compared with prior trials, with many patients having contraindications to thrombolysis (34.5%), prior failed systemic thrombolysis (11.8%), and a subset requiring ECMO or CPR during treatment. The study aimed to assess both acute safety outcomes and early hemodynamic efficacy, including changes in pulmonary artery pressures and right ventricular function.

The procedure demonstrated significant and rapid improvements in cardiopulmonary parameters. Immediately after thrombectomy, there was a mean reduction in systolic pulmonary artery pressure of about 10 mmHg (20%), along with a decrease in mean pulmonary artery pressure and improved oxygenation. Within 24–48 hours, right ventricular strain significantly improved, with the RV/LV ratio decreasing by 36%, and echocardiographic markers such as TAPSE (Tricuspid Annular Plane Systolic Excursion) showing meaningful recovery. Biomarkers of right heart strain (troponin and proBNP) and clinical parameters such as heart rate and lactate also improved significantly, supporting both physiologic and clinical benefit.

From a safety standpoint, the procedure demonstrated an acceptable complication profile in this high-risk population. Major bleeding occurred in only 1.8%, while procedure-related complications such as pulmonary artery injury and ischemic stroke were rare (each <2%). Early mortality was 0.9% intraprocedural and 5.5% within 48 hours, with most deaths occurring in patients with high-risk PE undergoing rescue therapy after failed thrombolysis. Thirty-day all-cause mortality was 8.2%, with some deaths attributed to comorbid malignancy rather than the procedure itself. Additionally, PE recurrence was not observed during follow-up.

Overall, it was concluded that CDMT with the 8F Indigo system appears to provide rapid hemodynamic improvement and RV recovery with relatively low bleeding risk, even in a sicker-than-usual PE population. While results showed good outcomes, the study is limited by its observational design, lack of a control group, and heterogeneous patient selection. The authors emphasize the need for future randomized trials to better define the role of mechanical thrombectomy compared with systemic anticoagulation, thrombolysis, and other catheter-based therapies in intermediate-high and high-risk pulmonary embolism.