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Intermediate Risk (Sub-massive) Pulmonary Emboli – Can Early CT Angiography Predict the Need for Escalation Therapy?

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Introduction: Intermediate risk (sub-massive) PE is defined as significant right ventricular dysfunction in hemodynamically stable patients. Thrombolysis in this group of patients is controversial. Identifying patients in whom the benefit of thrombolysis overweighs the risk of bleeding is challenging. The aim of this study was to identify CT Angiography (CTA) parameters which can predict which patients will need escalation therapy.

Methods: CTA parameters of 31 patients with intermediate risk PE were retrospectively reviewed for 10 different parameters: diameters of the right and left ventricle (RV and LV), the azygos vein, the main pulmonary artery (MPA) the aorta, the inferior and superior vena cava cross-section's area, the inter-ventricular septum (IVS) deviation, the IVC reflux, and clot load score (Quandli score). IVS deviation was dived into three subcategories, normal position, septal straightening and septal bowing towards the LV. CTA analysis was blinded regarding the treatment regimen.

Results: Thrombolysis was administrated in 6 out of the 31 patients. Among all analyzed parameters, the diameter of the RV and interventricular septal deviation were significantly different between the two treatment groups. The RV diameter was 57.3 mm in the thrombolysis group compared with 49.2 mm in the no-thrombolysis group (t-test, $p<0.01$). IVS deviation towards the LV appeared in almost all patients which needed thrombolysis (5/6) (chi-square test, $p=0.01$).

Conclusions: RV diameter and septal deviation on admission CTA represent significant RV pressure overload which eventually lead to pump failure and the need of escalation therapy. Further studies are needed in these patients to examine the impact of this risk stratification approach on the outcome.