

CT-Assessed Right Ventricular Dilatation Versus Echocardiographic Systolic Dysfunction in Intermediate-High-Risk Pulmonary Embolism

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Background: Both right ventricular (RV) dilatation on computed tomography (CT) and systolic dysfunction on echocardiography are used for risk stratification in acute pulmonary embolism (PE). Their relative prognostic value in intermediate-high-risk PE remains uncertain.

Methods: In this prospective observational study, 151 patients with intermediate-high-risk PE were evaluated. Reduced RV systolic function was defined as tricuspid annular plane systolic excursion (TAPSE) <16 mm, and marked RV dilatation as CT-derived RV/LV ratio ≥ 1.5 . The primary endpoint was in-hospital cardiorespiratory deterioration requiring high-flow nasal oxygen, non-invasive ventilation, or hemodynamic support. The secondary endpoint was in-hospital mortality. Both imaging parameters were evaluated using mutually adjusted logistic regression.

Results: Cardiorespiratory deterioration occurred in 39 patients (25.8%), and 11 patients (7.3%) died during hospitalization. Reduced TAPSE was present in 74 patients (49.0%), while CT RV/LV ≥ 1.5 was observed in 59 patients (39.1%). The two imaging parameters were discordant in 63 patients (41.7%).

In mutually adjusted analysis, TAPSE <16 mm was associated with both clinical deterioration and mortality, whereas CT RV/LV ≥ 1.5 did not reach statistical significance for either endpoint (Table 1). Patients with both abnormalities had the highest observed deterioration (40.0%) and mortality (20.0%) rates, compared with 11.3% and 1.9%, respectively, among patients without either abnormality.

Conclusions: Reduced TAPSE was associated with adverse in-hospital outcomes after adjustment for CT-assessed RV dilatation. Echocardiographic assessment of RV systolic function may provide complementary prognostic information beyond anatomical RV enlargement in intermediate-high-risk PE.

Table 1. Prognostic associations of echocardiographic and CT parameters

Predictor	Cardiorespiratory deterioration, OR (95% CI)	In-hospital mortality, OR (95% CI)
TAPSE <16 mm	2.42 (1.11–5.27); p=0.025	10.54 (1.30–85.42); p=0.027
CT RV/LV ≥ 1.5	2.01 (0.94–4.30); p=0.071	2.30 (0.62–8.55); p=0.212

Odds ratios are mutually adjusted for both imaging parameters. Mortality analyses are exploratory because of the limited number of events.