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Radiological Thrombus Localisation in the Evaluation of Pulmonary Thromboembolism

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Objectives: Thrombus in the pulmonary artery (PA) trunk and main branches may cause hemodynamic instability more frequently. However, thrombus localisation is not evaluated radiologically in the pulmonary embolism severity index (PESI) or simplified PESI, which determines the severity of pulmonary embolism (PE) or risk classification of the European Society of Cardiology (ESC), where the 1-month mortality risk is evaluated. In this study, we aimed to evaluate the patients who were diagnosed with PE in our clinic between January 2012 and December 2017 according to the presence of thrombus in the main PA or lobar/segmental arteries.

Methods: The characteristics of patients who were followed-up in our clinic between January 2012 and December 2017 with the diagnosis of PE were recorded retrospectively.

Results: A total of 206 patients diagnosed with PE were enrolled the study. In 68 patients, thrombus was in the main PA. The mean age of the patients was 63.3 ± 16.27 years and 52.4% of the patients were female. The rate of troponin and brain natriuretic peptid (BNP) elevation was higher in patients with main PA thrombus (50% vs 26% p: 0.002, 63% vs 33.3% p: 0.025, respectively). The rates of right ventricular dilatation and right ventricular hypokinesia in echocardiography were higher in patients with main PA thrombus than in those with lobar/segmental artery thrombi (49.1% vs 22% p: 0.001; 18.9% vs 4.4% p: 0.005). The prevalence of moderate-high and high-risk group in patients with main PA thrombus was higher than patients with lobar/segmental artery thrombus (36.4% vs 10.4% p<0.001, 10.6% vs 5.2% p<0.001, respectively). The right ventricular/left ventricular ratio was higher than 0.9 and over in the group with the main pulmonary artery thrombus (80.9% vs 67.4%, p: 0.043). There was no difference between the groups in terms of mortality (14.7% vs 11.6%, p: 0.527).

Conclusion: Regardless of the thrombus burden, troponin and BNP values, right ventricular dilatation and right ventricular hypokinesia ratio were found to be higher in patients with thrombus in the main PA than patients with lobar/segmental artery thrombus. In the risk assessment of patients, it should be considered that the rate of right ventricular dysfunction and cardiac damage may be higher in patients with pulmonary CT in patients with thrombus in the main PA, and these patients may be in increased risk groups in ESC risk classification, so they should be closely monitored.

Keywords: Pulmonary embolism, localisation of thrombus, venous thromboembolism