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Title: Pulmonary tumor thrombotic microangiopathy: A clinical analysis of 30 autopsy cases

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Body: Objective: Pulmonary tumor thrombotic microangiopathy (PTTM) is a rare, fatal form of pulmonary arterial tumor embolism. The aim of this study was to evaluate the clinical characteristics along the pathological and immunohistochemical findings of PTTM. Methods: Autopsy records in our hospital from 1983 to 2008 were reviewed, and those of patients who died from pulmonary tumor embolism resulting from malignant neoplasm were retrieved. The relevant tissue slides were reevaluated to confirm the diagnosis and examined immunohistochemically. Results: Among 2215 consecutive autopsy cases with carcinomas, 30 patients (1.4%) were diagnosed with definitive PTTM. The common symptom was progressive dyspnea. A hypercoagulative state was observed in all measured cases (n = 21). Chest computed tomography findings (n = 6) included consolidations, ground-glass opacities, small nodules, and tree-in-bud appearance. Perfusion scans was performed in 7 patients, 6 of whom demonstrated multiple small defects. The median survival time after initiation of oxygen supplementation was 9 days. The most frequent primary site was the stomach (n = 18; 60%), and the most frequent histological type was adenocarcinoma (28/30; 93.3%). Immunohistochemical findings for tumor cells located within the tumor emboli were positive for vascular endothelial growth factor (28/29; 96.6%) and tissue factor (29/29; 100%). Conclusions: We should suspect PTTM in cancer patients with acute worsening respiratory insufficiency accompanying elevated coagulation factors without embolism in major pulmonary arteries. The PTTM patients in our study had poor prognoses. Vascular endothelial growth factor and tissue factor may play important roles in PTTM.