

**Abstract:**

**OBJECTIVE:** Peripherally inserted central venous catheter (PICC)-related thrombosis (PRT) is a serious complication that can lead to interruptions in chemotherapy and other supportive care, as well as increased hospital stay and costs. We conducted a retrospective study to evaluate the patterns of symptomatic PRT in patients with cancer undergoing chemotherapy and their risk factors.

**METHODS:** A retrospective study of 938 PICC patients from our institution between November 2014 and July 2017 was performed. Symptomatic PRT events were confirmed by color Doppler ultrasonography or computed tomography pulmonary angiography in the presence of clinical symptoms. The variables of interest were extracted from the electronic medical record system. Logistic regression analysis was used to determine the risk factors for PRT.

**RESULTS:** Of the 938 patients who were followed up for more than 120,000 patient-days, 63 patients (6.7%; 0.51 per 1000 catheter-days) had symptomatic PRT. Sixty-one patients were diagnosed with upper extremity venous thrombosis (UEVT), of which 18 were isolated superficial vein thrombosis (SVT), 19 were isolated deep vein thrombosis (DVT), and 24 were extensive venous thrombosis (EVT). Two patients were diagnosed with pulmonary embolism, and two patients were diagnosed with UEVT with pulmonary embolism. The symptomatic SVT occurred in 42 of 938 patients with cancer (4.5%), which accounted for 68.9% of all UEVT events. The median time to PRT was 21 days, and the median time to catheter removal in the PRT group was 66 days as compared with 117 days in the no PRT group. Predictors associated with increased risk of PRT were age >60 years (odds ratio , 2.142; 95% confidence interval , 1.118-4.103) and a chemotherapy regimen containing fluorouracil (OR, 2.429; 95% CI, 1.013-5.825). Hypertension with medication was a protective factor for PRT (OR, 0.306; 95% CI, 0.113-0.828). Among the 28 patients who did not remove their PICCs immediately after PRT was diagnosed, patients with SVT, DVT, and EVT had similar success rates of retaining catheters in situ after anticoagulant therapy (SVT, 83.3%; DVT, 62.5%; EVT, 75.0%; P = .667).

**CONCLUSIONS:** Age >60 years and chemotherapy regimens containing fluorouracil were independent risk factors for PRT and hypertension with medication was associated with a lower risk of PRT in patients with cancer with PICCs receiving chemotherapy. PICCs-related SVT was a frequent type of PRT, which might need a better understanding and anticoagulant therapy in patients with cancer with PICCs.

**Reference:**

Chen, Y., Chen, H., Yang, J., Jin, W., Fu, D., Liu, M., Xu, Y., Tao, Z., Li, Y., Lu, L., Wang, M., Zhu, C. and Chen, Y. (2020) Patterns and risk factors of peripherally inserted central venous catheter-related symptomatic thrombosis events in patients with malignant tumors receiving chemotherapy. *Journal of Vascular Surgery. Venous and Lymphatic Disorders*. March 20th. doi: 10.1016/j.jvsv.2020.01.010. (Epub ahead of print).