# Predictive ability of modified Ottawa score for recurrence in patients with cancer-associated venous thromboembolisms: from the COMMAND VTE Registry

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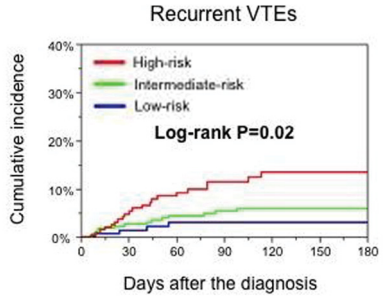
**Background/Introduction:** Patients with cancer-associated venous thromboembolisms (VTEs) have a markedly higher risk of recurrence as well as bleeding, compared to those without, leading to difficulty in achieving a good risk-to-benefit balance with anticoagulation therapy. Thus, the assessment of the risk of recurrence in an individual patient is essential. The modified Ottawa score has been developed to predict the risk of recurrence in patients with cancer-associated VTEs during anticoagulation therapy, however, the validity of the score is still controversial.

**Purpose:** We aimed to evaluate the utility and limitations of the modified Ottawa score in the risk stratification of recurrent VTEs in patients with cancer-associated VTEs.

**Methods:** The COMMAND VTE Registry is a multicenter retrospective registry enrolling 3027 consecutive patients with acute symptomatic VTEs among 29 Japanese centers between January 2010 and August 2014. The present study population consisted of 614 cancer-associated VTE patients with anticoagulation therapy beyond 10 days after the diagnosis, who were divided into 3 groups; High-risk group with a modified Ottawa score $\geq$1, Intermediate-risk group with a score = 0, and Low-risk group with a score $\leq$–1. To evaluate the discriminating power of the modified Ottawa score for recurrence, we described the receiver operating characteristic curve with a C-statistic, and evaluated the positive likelihood ratio as the predictive performance of the score for recurrence in each subgroup.

**Results:** The high-risk group accounted for 202 patients (33%), intermediate-risk group for 269 (44%), and low-risk group for 143 (23%). During the first 6 months of anticoagulation therapy, recurrent VTEs occurred in 39 patients. The cumulative incidence of recurrent VTEs substantially increased in the higher risk categories by the modified Ottawa score (High-risk group: 13.6%, Intermediate-risk group: 5.9%, and Low-risk group: 3.0%, Log-rank P=0.02) (Figure 1). The discriminating power of the score was modest with a C-statistic of 0.63 (95% CI 0.55–0.71). The positive likelihood ratios as the predictive performance of the score were 1.71 in the high-risk group, 0.81 in the intermediate-risk group, and 0.42 in the low-risk group. Women and patients with prior VTEs had numerically higher cumulative 6-month incidences of recurrent VTEs compared with those without, while patients with lung cancer, breast cancer, and without metastasis had numerically lower cumulative 6-month incidences of recurrent VTEs. Depending on the presence or absence of each score component, the risks of recurrence seemed to differ in the low-, intermediate-, and high-risk groups.

**Conclusions:** The risks of recurrence in patients with cancer-associated VTEs substantially increased in the higher risk categories by using the modified Ottawa score, but the discriminating power of the score for recurrence was modest with a widely variable impact of each score component on recurrence.




| | 0-day | 30-day | 90-day | 180-day |
|---|---|---|---|---|
| High-risk | | | | |
| N of patients with event | | 10 | 19 | 21 |
| N of patients at risk | 202 | 161 | 104 | 66 |
| Cumulative incidence | | 5.4% (2.9%-9.8%) | 11.6% (7.5%-17.7%) | 13.6% (8.9%-20.2%) |
| Intermediate-risk | | | | |
| N of patients with event | | 7 | 13 | 14 |
| N of patients at risk | 269 | 236 | 189 | 145 |
| Cumulative incidence | | 2.7% (1.3%-5.6%) | 5.4% (3.2%-9.1%) | 5.9% (3.5%-9.8%) |
| Low-risk | | | | |
| N of patients with event | | 2 | 4 | 4 |
| N of patients at risk | 143 | 130 | 110 | 85 |
| Cumulative incidence | | 1.5% (0.4%-5.7%) | 3.0% (1.1%-7.8%) | 3.0% (1.1%-7.8%) |

Figure 1