

Prediction of the Skeletal-Related Events in Patients with Non-Small Cell Lung Cancer

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Background

Lung cancer is one of the malignant cancers which frequently cause bone metastasis. Patients with bone metastasis are sometimes associated with skeletal-related events (SREs). These events deteriorate patient's quality of life (QOL) so tremendously that it is important to predict these events when treating these patients. To get a standardized evaluation for neoplastic instability of the spine between spine surgeons and non-spine surgeons, Spine Instability Neoplastic Score (SINS) was announced by the Spinal Oncology Study Group in 2010.

Purpose

The purpose of this research is to investigate the association between SREs and SINS for patients with non-small cell lung cancer. Moreover, we examined any prognostic factors associated with SREs.

Materials and methods

We investigated 47 patients with non-small cell lung cancer who were referred from the department of respiratory medicine between 200 and 2013. We classified them by using SINS when diagnosed with bone metastasis and separated into two groups; stable group (SINS: 0-6 points), unstable group (SINS: 7-18 points). The primary endpoint of this study was time from diagnosis as having bone metastasis to SREs. Simultaneously, as secondary end points, tumor types, EGFR mutation and any interventions to the patients (for example, the usage of steroid, bisphosphonates, radiotherapy, corset and tyrosine kinase inhibitors) were investigated. In this study, we defined SREs, spinal compression, pathological fracture, surgery to the spine and hypercalcemia.

Results

Patients included 37 cases of adeno carcinoma and 10 cases of squamous cell carcinoma. Median follow-up time was 5.6 months. The incidences of SREs were 15.0% (3/20) in the stable group and 44.4% (12/27) in the unstable group. From the analysis of the Kaplan Meyer Curve with log-rank test, the incidences of SREs were significantly lower in the stable group, compared to unstable group (Fig1). Multivariate analysis with Cox proportion hazards model revealed that EGFR+ (HR=0.15; 95% CI, 0.03-0.71; $p=0.017$) or good spinal stability (HR=0.49; 95% CI, 0.08-0.99; $p=0.049$) were favorable prognostic factors.

Conclusion

The incidences of SREs in patients with non-small cell lung cancer were significantly lower in the better spinal stability patients calculated by SINS. Therefore, SINS is a good prediction tool for SREs when bone metastasis is defined. Moreover, the lower occurrence of SREs in the patients with an EGFR mutation suggested that we should take into account biology of the tumors for prediction of SREs.

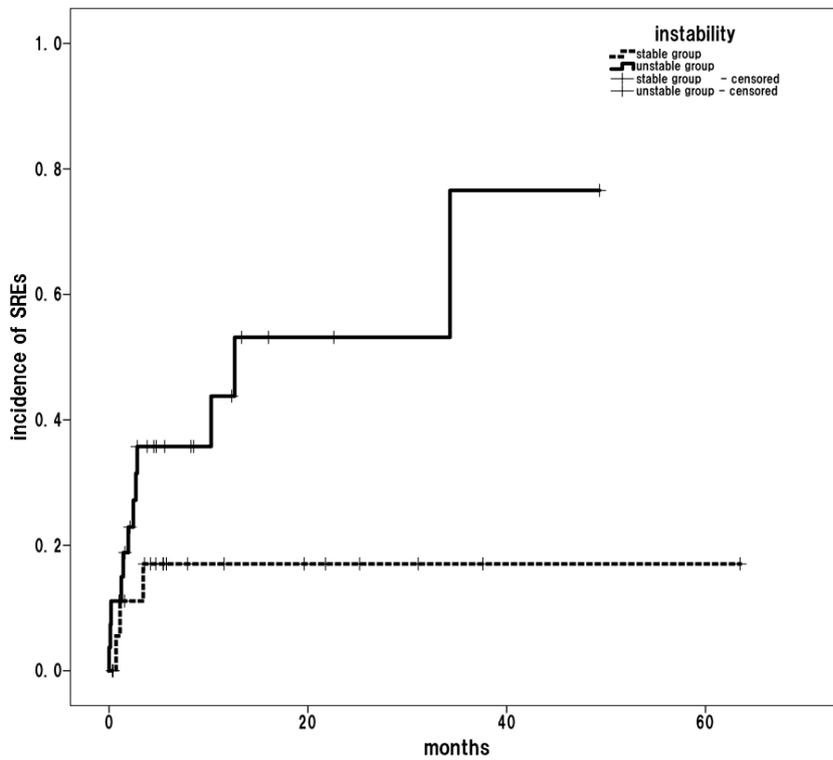


Fig1. Kaplan Meyer Curve of the incidences of SREs