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**Clinicopathological characteristics of patients with nivolumab-induced pneumonitis**

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**Purpose:** Nivolumab, an immune checkpoint inhibitor, exerts anti-tumor effects against various types of malignant tumor, whereas all usual care should be taken to its

related adverse events including immune-related adverse events (irAEs). Of these events, nivolumab-induced pneumonitis, which infrequently develops but sometimes results in a fatal outcome, requires an early detection and prompt response. The purpose of this study was to understand the pathogenesis of nivolumab-induced pneumonitis, leading to avoiding its onset and increase in severity.

**Patients and Methods:** The subjects were patients with malignant melanoma ( $n = 2$ ) and non-small cell lung cancer (NSCLC) ( $n = 2$ ), all of whom developed nivolumab-induced pneumonitis in Tokyo Medical University Hachioji Medical Center. We retrospectively analyzed clinicopathological characteristics of these patients from the medical records.

**Results:** The patients with a median age of 64.5 years were all males, and all NSCLCs consisted of adenocarcinoma histology. The median time from diagnosis to initiation of nivolumab treatment was 34.5 months, and three patients other than one malignant melanoma case developed the pneumonitis around two weeks after the first course of nivolumab treatment. Image findings showed a non-specific interstitial pneumonia (NSIP) pattern ameliorated by only treatment cessation in one patient with malignant melanoma and organizing pneumonia (OP) patterns that improved with corticosteroids and oxygen inhalation in other three patients. The median survival time from the initiation of nivolumab treatment was 165 days, and one patient with malignant melanoma who developed the pneumonitis 262 days after nivolumab treatment was successfully retreated with nivolumab.

**Conclusion:** Nivolumab had a high incidence of drug-induced pneumonitis, which consisted mostly of OP patterns highly responsive to corticosteroids. Particular attention should be paid to an early onset after the initiation of treatment.