A new NGS panel called lung cancer compact panel detection of *KRAS* G12D from pulmonary invasive mucinous adenocarcinoma

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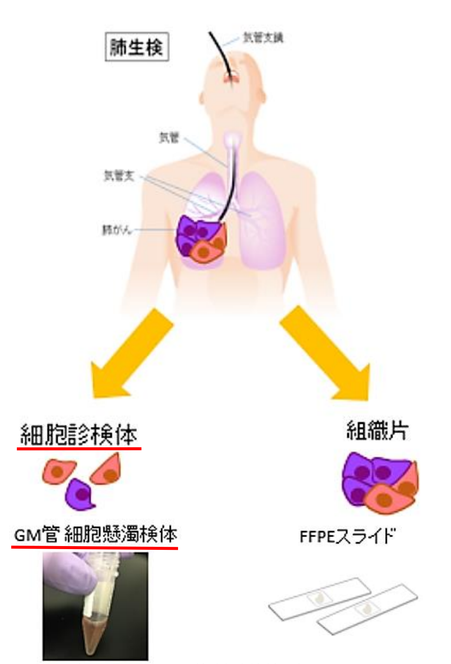
Lung Cancer Compact Panel



聖マリアンナ医科大学病院　FFPE検体と細胞診検体の比較
DNA Chip Research Inc.　H.P.

Background

Multiple cancer-related genes detection using next-generation sequencing (NGS), such as Foundation One CDx (Foundation Medicine, Inc.) and Oncomine™ Dx Target Test (Thermo Fisher Scientific), were useful for current molecular targeted agents with companion diagnostics for *EGFR*, *ALK*, *ROS1*, *BRAF*, *MET*, and *RET*, respectively. Meanwhile, the main limitation is the restriction of tumor samples: high tumor content (>20%) is required to perform the panel tests. Lung cancer compact panel is a new panel test, and achieves higher sensitivity than that of conventional NGS panels.

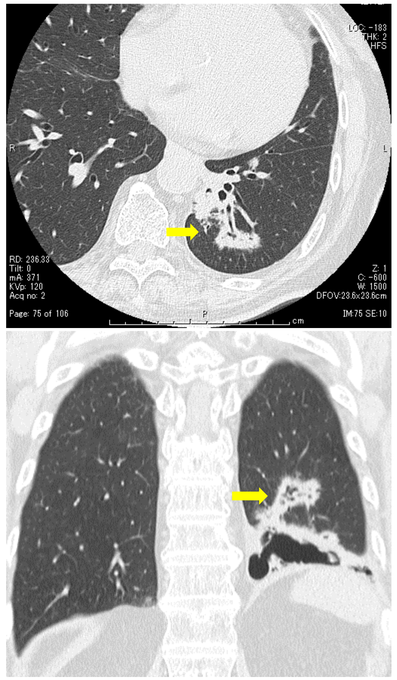
Objective

The objective of the present study was to evaluate Lung cancer compact panel.

We present a patient with pulmonary invasive mucinous adenocarcinoma of *KRAS* G12D detected by Lung cancer compact panel. Moreover, we show a patient with pleural effusion evaluated by the new panel test.

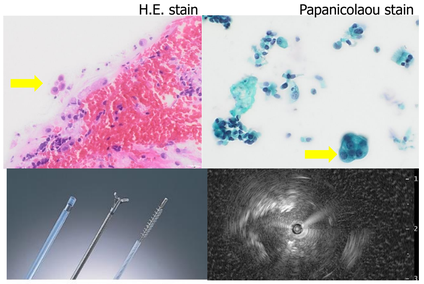
Case presentation 1

A 79-year-old woman with findings of abnormal chest shadows in the left lower lobe referred to our hospital. Although EBUS-GS was tried initially, we could not obtain sufficient specimens for pathological diagnosis, because of severe cough and pulmonary bulla adjacent to the tumor.



Case presentation 1

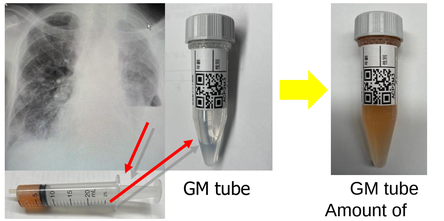
Although the brushing cytology was categorized as class II (Papanicolaou classification), the solution was subjected to a new NGS panel research called Lung cancer compact panel, because of sufficient EBUS view (with-in) and the enough sample to carry out next-generation sequencing (amount of nucleic acid: DNA 16.48 ng and RNA 196.96 ng). As a result, *KRAS* G12D was detected from the panel research. The allele frequency was 1.3%. Therefore, the patient underwent surgery without pathological evidence, and surgical pathology subsequently confirmed the diagnosis of pulmonary invasive mucinous adenocarcinoma.



Case presentation 2

A 71-year-old man with findings of left pleural effusion from lung adenocarcinoma, referred to our hospital. The pleural effusion (5 ml) was subjected to Lung cancer compact panel. Any mutation was not detected in the analysis. Meanwhile, the enough sample was obtained in GM tube to carry out NGS analysis (amount of nucleic acid: DNA 1100 ng and RNA 172.44 ng).

Case presentation 2



The pleural effusion (5 ml) from lung adenocarcinoma patient (class V) was subjected to Lung cancer compact panel.

The pleural effusion (5 ml) from lung adenocarcinoma (class V) was subjected to Lung cancer compact panel.

Summary

- Lung cancer compact panel was useful for both detection of *KRAS* G12D and diagnosis of pulmonary invasive mucinous adenocarcinoma.
- Even the small amount of pleural effusion from a lung adenocarcinoma patient was enough to carry out NGS (amount of nucleic acid: DNA 1100 ng and RNA 172.44 ng).

Conclusions

Lung cancer compact panel seems to be useful for analyzing gene mutation even in the small amount of tumor cells.

Conflict of Interest

Dr. Takigawa has received lecture fees from Chugai Pharmaceutical and Boehringer-Ingelheim outside this work. The other authors have no conflicts of interest to declare.