Usefulness of a fully automated and rapid genetic analysis system for detecting the BRAF V600E mutation of cytological samples in thyroid papillary carcinoma.

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【Introduction】
Although accurate rate for cytological diagnosis of thyroid papillary carcinoma (T-PA) is approximately 90% by detecting unique nuclear findings of intra-nuclear cytoplasmic inclusions and nuclear grooves, there are still “insufficient” samples due to dried cells and peripheral blood cells mixture. BRAF V600E mutation is found in 30 to 70% of T-PA and its detection gives high diagnostic value. In this study, we examined BRAF V600E mutation of cytological samples of thyroid including T-PA using a fully automated and rapid genetic analysis system (The i-densy system: ARKRAY, Inc.).

【MATERIAL&METHODS】
We retrieved 25 cases of thyroid specimens with both of cytological samples and formalin fixed, paraffin embedded (FFPE) sections available. The series were comprised of 15 cases of T-PA, 5 cases of adenomatous goiter and 5 cases of benign lesion.

The i-densy system has utilized BRAF specific guanine quenching probe (Q-probe). The cells on archival Papanicolaou stained samples were scraped off, collected in a microtube, and transferred to the reagent cartridge. The template was first denatured at 95°C for 10 minutes and mixed with primer, Q-probe and PCR reaction mix reagents. (http://i-densy.arkray.co.jp/index.html)

【Result】
- BRAF V600E mutation was observed in 11 of 15 cases of T-PA, 0 of 5 cases of adenomatous goiter and 0 of 5 cases of benign lesion.
- Correlated very well with correspondent FFPE sections (100%).
- When using cytological samples, the results can be obtained within 90 minutes.

【Conclusions】
We demonstrated that the i-densy system was enable to detect the BRAF V600E of cytological specimens of T-PA automatically, rapidly and efficiently.