Detection of RAS mutation by pyrosequencing in thyroid cytology samples
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Fine-needle aspiration cytology (FNAC) is the primary means to distinguish benign from malignant thyroid nodules. However, adjunctive diagnostic tests are needed as 20–40% of FNAC are inconclusive. RAS mutations have been described in differentiated thyroid cancer and they could be used as tumor markers. However, their prevalence varies widely among studies, probably as a result of the detection methods used. We investigated whether the pyrosequencing method can be applied to detect NRAS and KRAS mutations in thyroid aspirates.

A total of 37 thyroid aspirates, including benign hyperplastic nodules (HBN, N = 16) and follicular thyroid carcinomas (FTC, N = 21) were analyzed for the presence of NRAS 61 and KRAS 13 mutations.

A RAS mutation was found in 31% and 62% of BN and FTC respectively. Most samples displayed a percentage of mutated alleles lower than 50% (median = 30.8% and 15.3% in FTC and HBN respectively), a result compatible with the presence of extra-nodular cells contaminating the FNA or with the subclonal nature of both types of thyroid nodules.

RAS mutation can be detected by pyrosequencing in fine-needle thyroid aspirates, however it is not helpful to distinguish between FTC and benign nodules in inconclusive FNACs.