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CASE REPORT

Concomitant BRAF v600e and NRAS q61r Mutations in the same Thyroid Nodule: A Case Report

Brogna M[1*], Collina F[1], Losito S[1], Clery E[2], Montone A[1], DelSesto M[1] and Ferrara G[1]

[1]*Pathology Unit, Instituto Nazionale Tumori-IRCCS-Fondazione G. Pascale, Naples, Italy*
[2]*Department of Public Health, University of Naples Federico II, Naples, Italy*

Correspondence should be addressed to Brogna M, Pathology Unit, Instituto Nazionale Tumori-IRCCS-Fondazione G. Pascale, Naples, Italy

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ABSTRACT

BACKGROUND

Papillary thyroid cancer (PTC) is the most common type of well differentiated endocrine malignancy. Generally thyroid nodules with multiple oncogenic mutations are uncommon with an occurrence which may be related to more aggressive biological behavior of tumors.

RET/PTC rearrangement, RAS, and BRAF mutations are considered to be mutually exclusive in papillary thyroid carcinoma (PTC). Concomitant RET/PTC, RAS, or BRAF mutations have been documented, although the impact of these mutations for tumor growth and survival is debated.

CASE PRESENTATION

Here we present, a rare case of woman 46 years old with a neck mass and thyroid nodule classified as TIR5 on cytological examination.

We found contemporary BRAF p. (Val600Glu) (p. (V600E); c. 1799T>A) and NRAS p. (Gln61Arg) (p. (Q61R); c.182A>G) mutations in morphologically different areas within the same lobe (the right one); The two lesions show different morphology. The mutated BRAF lesion showed morphological characteristics compatible with classic papillary carcinoma; The mutant NRAS lesion shows morphological features compatible with follicular variant papillary carcinoma.

To the best of our knowledge, this is the first time that such mutations, which are normally mutually exclusive, have been detected at the same time.

CONCLUSION

The finding of synchronous mutations is a rare occurrence suggesting for intratumoral heterogeneity (ITH) even in PTC.

Patients with multiple mutations have a clinical worse prognosis, generally characterized by an aggressive thyroid cancer, which may influence the surgical treatment, chemotherapy, and BRAFV600E mutation-targeting therapy.

KEYWORDS

Papillary thyroid cancer; Concomitant mutations; Intratumoral heterogeneity; Prognostic markers; Cytology

Authors' Contribution

All authors have read, edited, and contributed to the content of this manuscript. This work has not been previously published and has not been considered for publication elsewhere.

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