

## **THYROID FNA BRAF POSITIVITY CORRELATES WITH A HIGHER GRADE BETHESDA CATEGORY**

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**Background/Purpose:** To investigate the incidence of the V600E BRAF mutation (BRAF<sup>+ve</sup>) in an Australian population with papillary thyroid cancer (PTC) and to examine its correlation with the corresponding FNA Bethesda category.

**Methods:** Thyroid tissue was obtained from 70 patients who had thyroidectomies at Royal Prince Alfred Hospital. DNA was extracted from fine needle aspiration (FNA), fresh frozen tissue or paraffin blocks. BRAF<sup>+ve</sup> was detected by melt curve analysis and confirmed by DNA sequencing. In a subgroup of patients, results for FNA and tissue were compared for Bethesda category, histopathology diagnoses and BRAF<sup>+ve</sup> presence.

**Results:** 36 of the 70 cases were histologically confirmed PTC. Of these, 31 were classic and 5 were follicular variant. BRAF<sup>+ve</sup> was detected in 23/36 (64%) PTC. Of the classic variant, 21/31 (68%) were BRAF<sup>+ve</sup> compared to 2/5 (40%) in those with the follicular variant.

Of the 70 cases, 27 had FNA Bethesda classification. On histopathology, 12 were PTC and 15 were benign. 9/12 cases were BRAF<sup>+ve</sup>, all were the classic variant of PTC and Bethesda category 5-6. 3/12 were BRAF<sup>-ve</sup>, all were follicular variant and Bethesda 3,5 and 5. The 15 benign nodules were all BRAF<sup>-ve</sup> and were Bethesda 2-4.

**Discussion & Conclusion:** The BRAF mutation incidence is similar to those described in other Australian and American populations with higher incidence in the classic variant. Although not all PTC are BRAF<sup>+ve</sup>, a positive result can be a useful addition to improve the predictive risk of malignancy, especially in thyroid nodules with indeterminate cytology.