Ancillary studies (Non-core)

Ancillary studies may be used to determine lineage, disease classification or subclassification; as prognostic biomarkers; or to indicate the likelihood of patient response to specific biological therapies.

In cases in which the diagnosis is suspected to be medullary carcinoma, immunostaining for calcitonin, chromogranin, synaptophysin, carcinoembryonic antigen (CEA) and thyroglobulin may be performed to confirm the diagnosis. The calcitonin, CEA, chromogranin and synaptophysin immunostains are also helpful to identify C-cell hyperplasia.

Thyroglobulin, thyroid transcription factor-1 (TTF-1) and PAX8 may indicate that a tumour is of follicular cell origin. TTF-1 is more sensitive than thyroglobulin however, TTF-1 can be positive in other cancers such as lung adenocarcinoma and small cell carcinoma of any primary site. Anaplastic thyroid carcinoma is negative for thyroglobulin, positive focally for TTF-1 in a small percentage of cases, but labels for PAX-8 in a substantial number of cases.[1]

It is not possible to differentiate benign and malignant thyroid tumours by using immunohistochemistry. Although cytokeratin 19, other high molecular weight cytokeratins and some other markers have been demonstrated to have stronger positivity in thyroid carcinomas than benign thyroid lesions, there are many exceptions and the interpretation has to be taken in the context of the morphology of the lesion.

Molecular analyses are currently being performed to identify targets in tumour refractory to radioactive iodine therapy. Immunostain for *BRAFV600E* mutation is an easy to perform, robust and rapid assay to select patients for *BRAF* inhibitor therapy.

Reference

1 Nonaka D, Tang Y, Chiriboga L, Rivera M and Ghossein R (2008). Diagnostic utility of thyroid transcription factors Pax8 and TTF-2 (FoxE1) in thyroid epithelial neoplasms. *Mod Pathol* 21(2):192-200.