Background Papillary thyroid microcarcinomas (PTMC) are papillary thyroid carcinomas (PTC) measuring ≤ 1 cm. Their prognosis is excellent. However, a subset of them behave aggressively with recurrence, metastasis, and cancer-specific mortality of up to 2%. The tall cell variant (TCV) of PTC is a particularly aggressive tumor that generally presents in advanced stage and is associated with higher disease-related mortality. Recognizing this variant in PTMC may help select aggressive microcarcinomas for more intensive therapy.

Methods Clinico-pathological features of 23 TCV of PTMC in 21 patients were reviewed. DNA was extracted from tumor tissue and BRAF V600E mutational analysis was performed by single strand conformational polymorphism.

Results The patients included 17 women and 4 men aged 34 to 74 years (median 54 yrs). All patients underwent total thyroidectomy. Eleven of 21 thyroids (52%) contained multifocal PTMC but only in two patients was the additional PTMC of the TCV. The tumors ranged from 2 mm to 10 mm (median 7 mm). The majority of tumor cells were at least twice as tall as wide, had moderate to abundant eosinophilic cytoplasm, and classic nuclear features of PTC with frequent intranuclear inclusions. Four tumors showed lymphovascular invasion (17%) and seven exhibited extrathyroidal extension (PT3, 30%). Lymph nodes were dissected in fourteen patients, and showed metastases to level VI nodes (pN1a) in three (21%) and lateral cervical lymph nodes (pN1b) in two patients (14%). Nineteen of twenty-one tumors harbored BRAF V600E mutations (90%). Six of eighteen were positive for PTC (Figure 1). Gross examination of PTMC comprised of a majority (>50%) of tall cells whose heights were at least twice that of their width (5). These tumors characteristically presented in advanced stage and is associated with higher disease-related mortality. Recognizing these poorly behaving tumors will help triage PTMC for additional therapy. The TCV is a known aggressive subtype of PTC. Pathways with TCV have the highest rate of extrathyroidal extension and distant metastases at presentation, and increased mortality when compared to the classic variant of PTC (3, 4). To our knowledge, the recognition of TCV among papillary thyroid microcarcinomas is generally not attempted in routine diagnostic surgical pathology as its significance remains unknown. In this study, we report the clinico-pathological characteristics of the tall cell variant of papillary thyroid microcarcinoma, and compare them to age and size matched classic variants of PTC.

DISCUSSION & CONCLUSIONS

TCV of PTC is a morphologically distinct entity and can be recognized on routine microscopy following the usual definition. The majority of these tumors were >5 mm in size, and are characterized by a higher prevalence of extrathyroidal extension, lymphovascular invasion, multifocality, BRAF V600E mutation and a more advanced stage presentation.

However, there was no significant difference in lymph node status when compared with age and size matched classic variant PTC which may be reflective of the fact that three quarters of these tumors were greater than 5 mm. A larger case series is needed to fully explore these trends and understand their significance.

REFERENCES