**Supplemental Table 1**: Comparison of pathologic features between cases of PTC with weak or no driver variants and cases of PTC with strong driver variants

| Pathologic feature | | | PTC with weak or no driver variants N= 7 | PTC with strong driver variants N= 12 | P value |
|---|---|---|---|---|---|
| Size (cm) | | | 2.2 | 2.07 | 0.41 |
| Focality | Unifocal | | 4 | 6 | 0.57 |
| | Multifocal | | 3 | 6 | |
| Type | Pure classic PTC | | 2 | 6 | 0.33 |
| | Mixed classic and follicular | | 4 | 6 | |
| | Pure follicular | | 1 | 0 | |
| Positive lymph nodes (LN) | Negative | | 2 | 2 | 0.47 |
| | Positive | | 5 | 10 | |
| Ratio of positive LN to total number of LN retrieved | | | 0.41 | 0.50 | 0.43 |
| Extranodal extension (available only in 17 cases) | Absent | | 1 | 1 | 0.59 |
| | Present | | 5 | 10 | |
| Lymphovascular invasion | Absent | | 1 | 1 | 0.61 |
| | Present | | 6 | 11 | |
| Angioinvasion (available only in 18 cases) | | Absent | 6 | 6 | 0.19 |
| | | Present | 1 | 5 | |
| Margin status | Negative | | 4 | 9 | 0.37 |
| | Positive | | 3 | 3 | |

**Supplemental Table 2:** Comparison of pathologic features between cases of PTC with fusions (*RET-PTC* or *ETV6-NTRK3*) and cases of PTC with *BRAF*$^{V600E}$ variants

| Pathologic feature | | | PTC with fusions N= 4 | PTC with *BRAF*$^{V600E}$ N= 8 | P value |
|---|---|---|---|---|---|
| Size (cm) | | | 2.45 | 1.88 | NA |
| Focality | Unifocal | | 2 | 4 | 0.72 |
| | Multifocal | | 2 | 4 | |
| Type | Pure classic PTC | | 3 | 3 | 0.27 |
| | Mixed classic and follicular | | 1 | 5 | |
| Positive lymph nodes (LN) | Negative | | 1 | 1 | 0.57 |
| | Positive | | 3 | 7 | |
| Ratio of positive LN to total number of LN retrieved | | | 0.27 | 0.61 | NA |
| Extranodal extension (available only in 10 cases) | Absent | | 2 | 7 | 0.30 |
| | Present | | 1 | 0 | |
| Lymphovascular invasion | Absent | | 1 | 0 | 0.33 |
| | Present | | 3 | 8 | |
| Angioinvasion (available only in 11 cases) | | Absent | 1 | 5 | 0.19 |
| | | Present | 3 | 2 | |
| Margin status | Negative | | 2 | 7 | 0.23 |
| | Positive | | 2 | 1 | |