



TROP-2 is a novel reliable marker for immunohistochemical diagnosis of papillary thyroid carcinoma

Andrey Bychkov, Pichet Sampatanukul, Shanop Shuangshoti, Somboon Keelawat
 Department of Pathology, Faculty of Medicine, Chulalongkorn University, Bangkok, Thailand

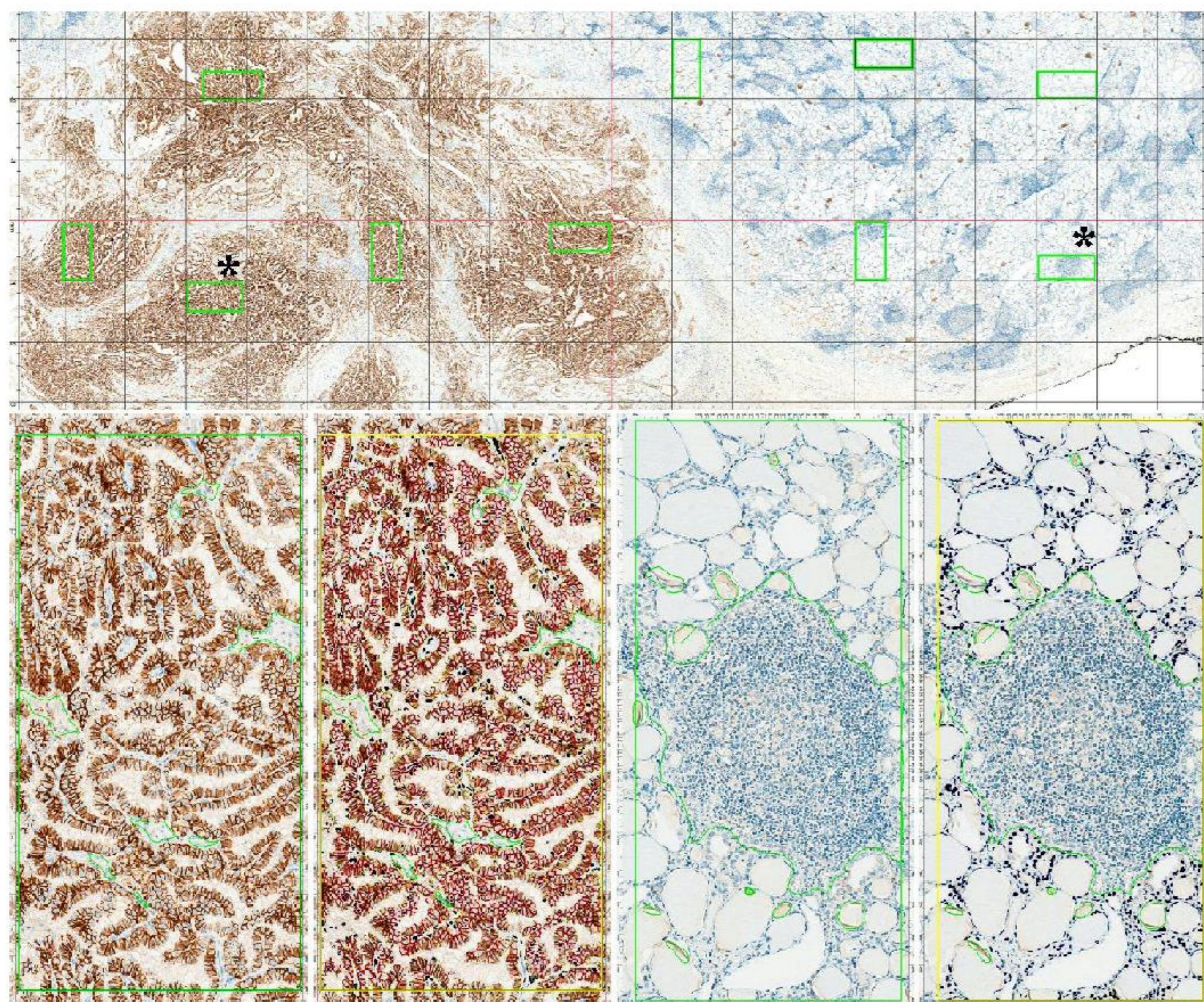
Introduction and Objective

- Immunohistochemistry (IHC) in thyroid pathology is recruited for differentiating between benign and malignant tumors
- There is no single antibody that can render definitive diagnosis
- Most of the recently identified IHC markers have never been assimilated into daily clinical practice due to their low reproducibility and other limitations
- TROP-2 IHC was recently reported as a useful tool for identifying PTC in fine-needle aspirate and tissue microarray samples
- We aimed to validate utility of TROP-2 immunostaining in the differential diagnosis of thyroid tumors

Materials and Methods

Lesion	n	Mean age	F:M	Mean size
Nodular goiter	16	48.1	15:1	n/a
Hashimoto's thyroiditis	10	47.0	9:1	n/a
Graves' disease	14	27.6	3.7:1	n/a
Follicular adenoma	47	48.4	2.9:1	42.4
Follicular carcinoma	35	52.6	4.8:1	44.7
Papillary carcinoma, incl.	114	47.8	3.5:1	30.1
<i>microcarcinoma</i>	13	48.4	4.3:1	3.9
<i>PTC classic variant</i>	53	45.0	4.3:1	31.0
<i>PTC follicular variant</i>	38	47.9	3.2:1	39.0
<i>PTC tall cell variant</i>	10	56.2	1.5:1	41.0
Poorly diff. carcinoma	8	55.9	1:1	56.0
Anaplastic carcinoma	10	65.1	2.3:1	80.6
Medullary carcinoma	12	50.3	3:1	29.3

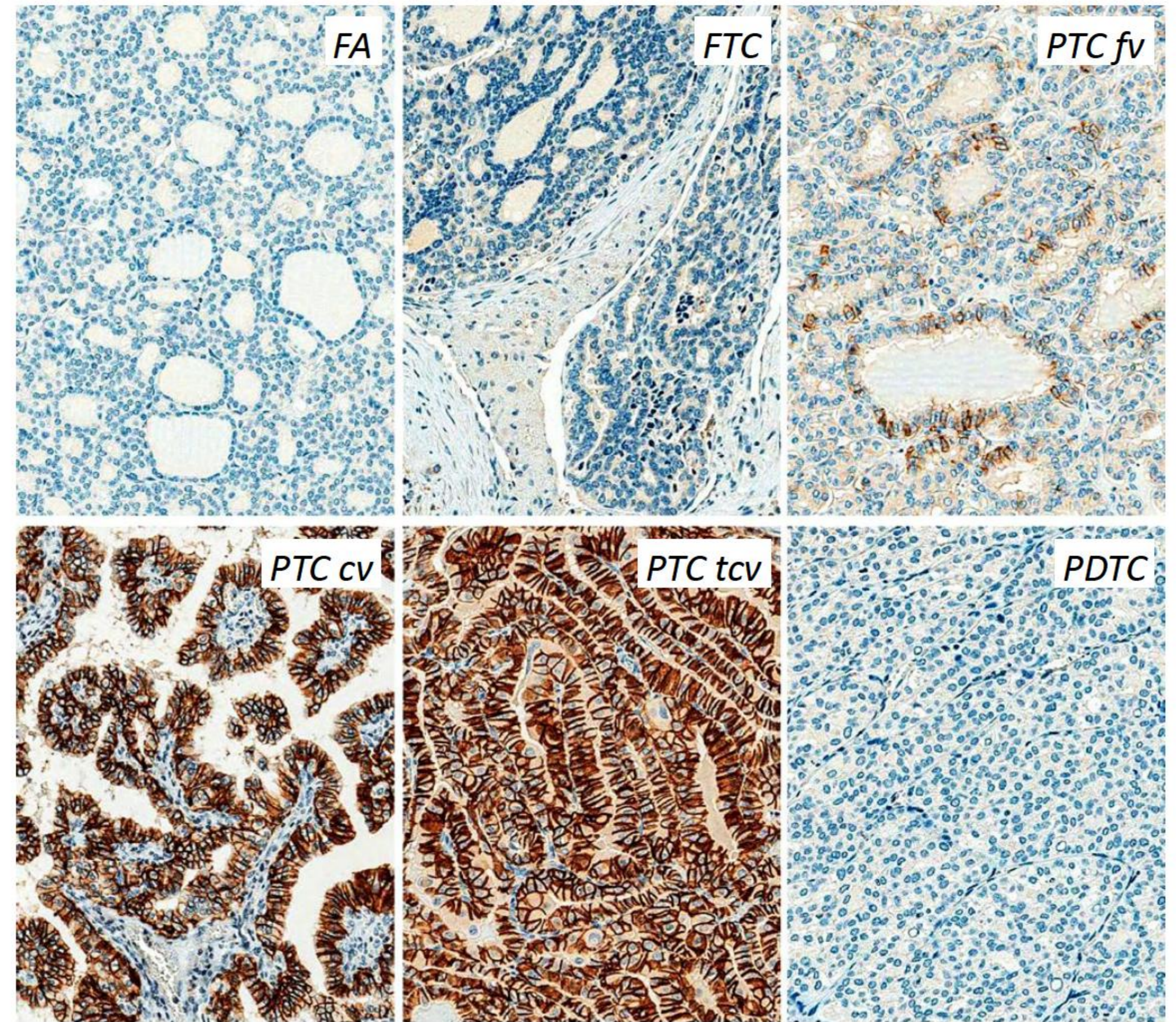
Patients' characteristics



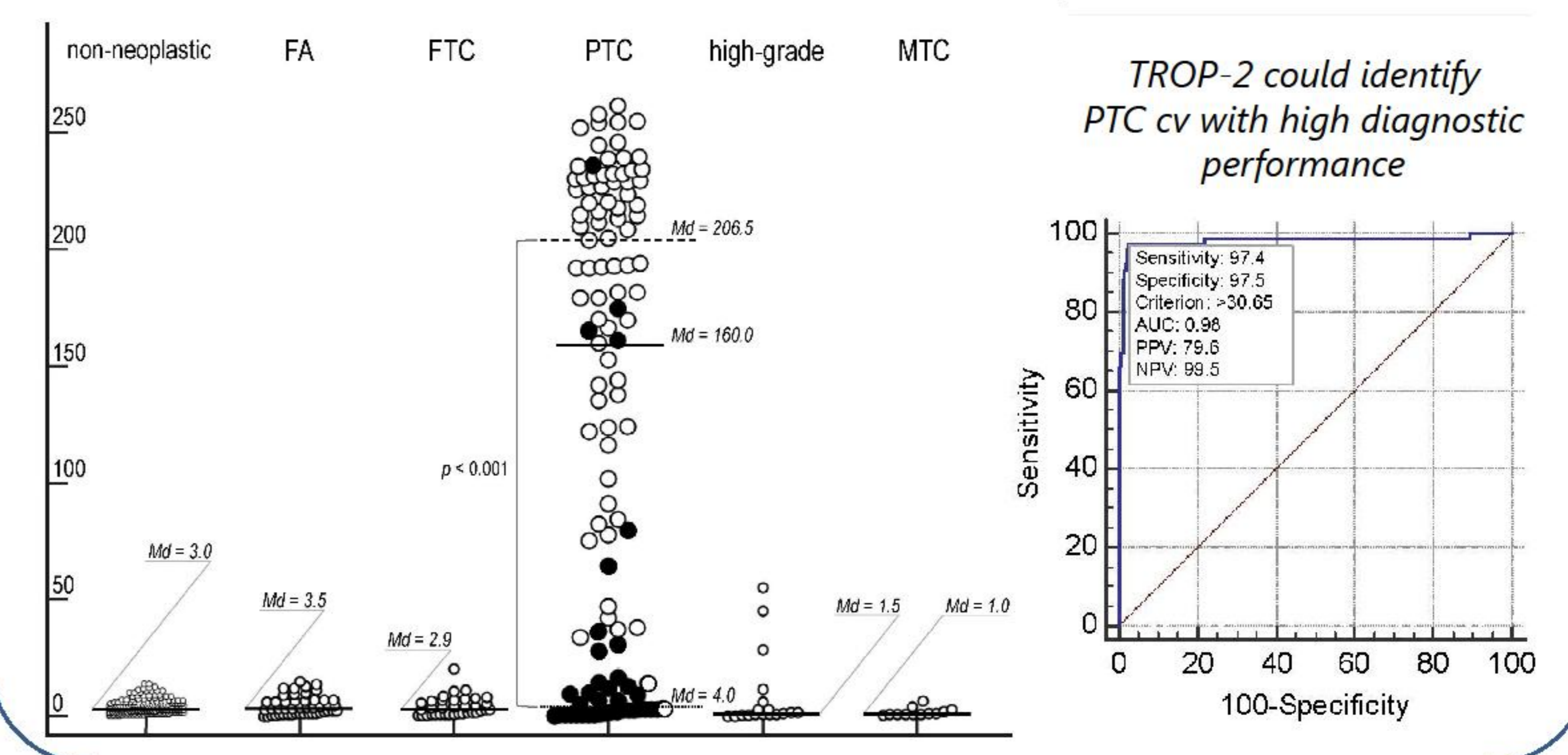
Automated digital image analysis

Membrane: H-Score	244.8	Membrane: Percent (0+)	0.24	Membrane: H-Score	1.3	Membrane: Percent (0+)	98.16
Number of Cells	3312	Membrane: Percent (1+)	27.11	Number of Cells	705	Membrane: Percent (1+)	1.84
Area (um2)	421759	Membrane: Percent (2+)	0.21	Area (um2)	383225	Membrane: Percent (2+)	0
Algorithm	Membranous v9	Membrane: Percent (3+)	72.43	Algorithm	Membranous v9	Membrane: Percent (3+)	0

Results



- The majority of PTC specimens (94/114, 82.5%) were positive for TROP-2
- All mPTC, PTC cv, and PTC tcv were TROP-2-positive with mainly diffuse staining; less than half of PTC fv were positive for TROP-2, with only focal immunoreactivity
- TROP-2 H-score was significantly associated with PTC variant and presence of capsular invasion in encapsulated PTC fv ($p < 0.01$), but none of the baseline and clinical parameters



Conclusions

- TROP-2 membranous staining is a very sensitive and specific marker for PTC cv, PTC tcv, and mPTC – with high overall specificity for PTC
- More than 10% of TROP-2 positive cells in a section, regardless of intensity of membranous staining supports a diagnosis of PTC
- TROP-2 is recommended for use in differential diagnosis of benign and malignant thyroid nodules