

Biopsy or no biopsy? Risk of Malignancy in Thyroid Nodules Based on TI-RADS Criteria

Faadil Shariff¹, Vivek Halappa²

¹Indiana University School of Medicine), ²Indiana University School of Medicine, Department of Radiology & Imaging Sciences

Purpose: To assess the risk of malignancy in thyroid nodules recommended for biopsy using the American College of Radiology (ACR) Thyroid Imaging Reporting & Data System (TI-RADS).

Methods: We conducted a retrospective review of ultrasound (US) guided thyroid biopsies performed from 2018- 2023 at IU Health hospitals for nodules which were recommended for biopsy based on ACR TI-RADS criteria and compared with histopathology results. The research was conducted at University and Methodist Hospital radiology reading rooms.

Results: Of the total 210 thyroid nodules recommended for biopsy, only 8.57% of nodules biopsied were malignant. Positive malignancy rate for TR-3 was 10.2%, TR-4 was 7.1%, and TR-5 was 12.5%. TR-3 nodules less than 2.9 cm were all benign on histopathology. TR-4 nodules less than 1.5 cm were all benign on histopathology. TR-5 nodules were all benign on histopathology. The most common malignancy was papillary thyroid carcinoma.

Conclusion: ACR TI-RADS is currently the standard of care for guidelines and lexicon for radiologists for characterizing thyroid nodules. Our results demonstrate that all TR-3 nodules less than 2.9 cm were all benign and most of the TR-4 and TR-5 nodules biopsied were benign on histopathology. The lower biopsy rate for positive malignancy even for TR-4 and TR-5 nodules respectively raises the need for revision for existing TI-RADS criteria, as more nodules could be followed up with ultrasound rather than percutaneous biopsy, which will alleviate patient anxiety as well as decrease overall healthcare costs.