

Ultrasonographic Evaluation of Thyroid Nodules Using TIRADS and Correlation with FNAC Findings

Dr. Beerendra Singh

Shyam Shah Medical College (SSMC), Rewa, Madhya Pradesh, India

Dr. Sanjeev Kumar Sharma

Shyam Shah Medical College (SSMC), Rewa, Madhya Pradesh, India

Dr. Sudeept Dwivedi

Shyam Shah Medical College (SSMC), Rewa, Madhya Pradesh, India

Dr. Lokesh Tripathi

Shyam Shah Medical College (SSMC), Rewa, Madhya Pradesh, India

Abstract:

Background: Thyroid nodules are a common clinical finding, and accurate risk stratification is essential to differentiate benign from malignant lesions. Ultrasonography (USG) with Thyroid Imaging Reporting and Data System (TIRADS) grading has emerged as a reliable, non-invasive tool, while Fine Needle Aspiration Cytology (FNAC) remains the reference standard for diagnosis.

Aim: To evaluate ultrasonographic features of thyroid nodules using TIRADS grading and correlate them with FNAC findings.

Materials and Methods: This cross-sectional observational study was conducted in the Department of Radiodiagnosis at Shyam Shah Medical College and associated S.G.M.H., Rewa (M.P.), including 50 patients with thyroid nodules. Demographic data, USG characteristics (composition, echogenicity, margins, calcification, and shape), and TIRADS grading were recorded. FNAC was performed in all cases, and findings were correlated statistically using chi-square tests, with $p < 0.05$ considered significant.

Results: The mean age was 41.8 ± 16.2 years, with a female predominance (82%). Mixed composition nodules were most common (60%). TIRADS distribution showed 36% benign (Grade 1–2), 34% intermediate (Grade 3), 18% suspicious (Grade 4), and 12% highly suspicious (Grade 5) lesions. FNAC results revealed 86% benign, 12% malignant, and 2% non-diagnostic cases. Malignancy was more frequent in solid nodules and those with hypoechogenicity, ill-defined margins, taller-than-wide shape, and punctate calcifications. A strong correlation was observed between higher TIRADS grades (4 and 5) and malignant FNAC outcomes ($p = 0.01$). Calcification patterns and USG composition also showed statistically significant associations with malignancy.

Conclusion: Ultrasonography with TIRADS grading is a valuable, non-invasive modality for risk stratification of thyroid nodules. Higher TIRADS grades and suspicious sonographic features significantly correlate with malignant cytology on FNAC, supporting its role in guiding clinical decision-making and reducing unnecessary invasive procedures.

Keywords:

Thyroid nodule, Ultrasonography, TIRADS, FNAC, Thyroid malignancy, Risk stratification, Calcification, Echogenicity.