

Comparative Study of TI-RADS, Elasticity Score, Strain Ratio and Quantitative Diffusion MR Weighted Imaging in Characterization of Thyroid Nodules; Which Has the Best Diagnostic performance?

Abstract

Patients and methods: Our study is prospective. 59 patients with 59 thyroid nodules were enrolled in this study. Conventional ultrasound with TI-RADS categorization, ultrasound strain elastography (elasticity score and strain ratio) as well as diffusion-weighted MR imaging and ADC value were evaluated for all cases. Histopathology results were the standard reference.

Results: TI-RADS score had (80 %) sensitivity, (89.8 %) specificity and (84.9 %) accuracy. Elasticity score using 4-points Asteria's criteria with cutoff value =3 had (70 %) sensitivity, (91.8 %) specificity and (80.9 %) accuracy. When a cutoff value of 1.65 was used for strain ratio; (90 %) sensitivity, (71.4 %) specificity and (91.8 %) diagnostic accuracy noted. When a cutoff value of 1.45×10^{-3} was used for ADC value; (80 %) sensitivity, (95.9 %) specificity and overall accuracy (98%) noticed. Multiparametric analysis enhanced the overall accuracy of TI-RADS scoring with the best diagnostic performance was achieved in our study by combining diffusion ADC value to the TI-RADS scoring with sensitivity 100%, specificity 95.9% and accuracy 98%.

Conclusions: Strain ratio and diffusion ADC value had higher diagnostic performance than US TI- RADS scoring in characterizing thyroid nodules. The best diagnostic performance in our study was achieved by combining diffusion ADC value to the TI-RADS scoring with overall accuracy of about 98%.

Keywords: Thyroid nodules, strain elastography, diffusion, TI-RADS, ADC.