



Fayoum University
Faculty of Medicine

**Comparative Evaluation Of Ultrasound Strain
Elastography
And Diffusion Weighted Magnetic Resonance
Imaging In Differentiating Malignant From
Benign Thyroid Nodules**

By

Dr \ Ahmed Adel Mahmoud Mostafa Wasify

Under the supervision of

Prof. Dr.

Ashraf Talaat Yousef Hussein

Professor of Radiology
Faculty of medicine
Fayoum University

Dr.

Ahmed Mohamed Magdy Mahmoud

Lecturer of Radiology
Faculty of medicine
Fayoum University

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Name of candidate: Ahmed Adel Mahmoud Mostafa

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Supervisors:

1. Dr. Ashraf Talaat Yousef
2. Dr. Ahmed Mohamed Magdy

Department: Diagnostic radiology.

ABSTRACT

Abstract Background: Thyroid nodule definite characterization is usually done using a fine needle aspiration cytology/biopsy. The aim of this study was to evaluate the role of ultrasound strain elastography & diffusion weighted imaging to differentiate benign from malignant thyroid nodules.

Methods: Our study is a prospective. 59 patients (20 males and 39 females, mean age 37.9 years) with 59 thyroid nodules were included in the study. Conventional ultrasound, ultrasound strain elastography and diffusion-weighted MR imaging with its

quantitative parameter apparent diffusion coefficient (ADC) were done for all cases. Histopathological samples results were the standard reference.

Results: We found that ACR TI-RADS scoring system had (80 %) sensitivity ,(89.8%) specificity and (84.9 %) diagnostic accuracy. Regarding the 4-points Asteria's criteria for elastography score; we found that it had (70 %) sensitivity, (91.8 %) specificity and (80.9 %) diagnostic accuracy. When a cutoff value of 1.65 was used for strain ratio; 90 % sensitivity, 71.4 % specificity and diagnostic accuracy of about 91.8 % noted. When a cutoff value of 1.45×10^{-3} was used for ADC value; 80 % sensitivity, 95.9 % specificity and overall accuracy of about 98% were detected. The best diagnostic performance was achieved in our study by adding diffusion ADC value to the ACR TI-RADS with sensitivity 100%, specificity 95.9% and accuracy 98% in differentiation of benign and malignant thyroid nodules.

Conclusion: Strain elastography and diffusion ADC value enhanced diagnostic performance of thyroid ultrasound. The best diagnostic performance was achieved by adding diffusion ADC to the ACR TI-RADS.

: Thyroid nodules, conventional ultrasound, ultrasound strain **Key words** elastography , strain ratio , TI-RADS , diffusion-weighted magnetic resonance imaging , apparent diffusion coefficient.