Determination of diagnostic accuracy of ACR (TI-RADS) in thyroid nodules on ultrasonography, keeping Bethesda cytological score at FNAC as gold standard

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Abstract

Purpose: TIRADS (Thyroid Imaging Reporting and Data System) is a risk stratification system for classifying thyroid lesions and was recently recognized by American College of Radiology (ACR) in 2017. TIRADS classification is now being used in daily routine categorization of sonographically visualized thyroid nodules. The aim of the study was to categorize all solid nodules of thyroid identified sonographically according to the TIRADS score and correlating the TIRADS score with BETHESDA histopathological category of the same nodule after FNAC. This correlation if validated could help avoid many unnecessary aspirations and thyroid related surgical procedures in cases where both sonographic and histopathological grades are low and to warrant early intervention in case of high scores with increasing risk of malignancy.

Introduction: Thyroid nodule is defined as a discrete lesion that may be differentiated radiologically from thyroid parenchyma which is surrounding it. Incidence is stated to be about 4% to 7% within the fashionable population. The appearance of high resolution ultrasound has resulted in expanded detection of incidental asymptomatic thyroid nodules. Zamora EA et al., showed that incidental thyroid nodules in adults changed into as a lot as 27% to sixty seven% [2]. various studies have proven prevalence of malignancy in these incidental nodules to vary from 2% to 12%. Imaging modalities like Doppler ultrasound, Computed Tomography (CT), nuclear scans and Positron Emission Tomography (pet) had been used to differentiate benign and thyroid nodules. TIRADS based totally on 5 ultrasound functions was created with the number one aim of imparting guidelines in management of those nodules. Ultrasound guided FNAC is desired for evaluation of any suspicious nodule. it's far an invasive process and when more than one nodules are encountered, simplest the most suspicious nodule is selected for aspiration. Elastography is a current non-invasive dynamic imaging technique which assesses the pliability or hardness of lesions to make the diagnosis. The Elastographic picture is obtained through compressing continuously after which the transducer decompression. After compression the deformation inside the tissue due to strain is measured and malignant lesions are tougher than benign nodules. In evaluation to the conventional Ultrasound on my own, higher accuracy is confirmed by means of the pressure elastography rating combined with conventional US. there are numerous research published in this subject matter, however only a few are there wherein pressure elastography is combined with TIRADS. On this gift have a look at, authors seek to set up the diagnostic efficacy of strain elastography in aggregate with TIRADS to distinguish malignant and benign thyroid nodules through correlating with FNAC or Histopathological exam (HPE).

Methods and materials: Ultrasound of thyroid was carried out on GE logic with linear transducer of 7.5 – 12 MHz frequency. 210 patients referred for sonography of thyroid nodules were included in the study from 1st January 2017 to 31st July 2018. Fine needle aspiration was carried out under ultrasound guidance and cytology was done of all nodules categorized according to TIRADS. TIRADS and Bethesda scores were correlated.

This prospective move-sectional observe turned into performed after getting approval from our Institutional ethics committee (1323/IEC/2017)

and consent turned into received from all sufferers. a complete of 135 sufferers with thyroid nodules who got here to department of Radiology, SRM clinical college clinic and studies Centre at some stage in the length from January 2018 to July 2019 had been included in the have a look at. in step with a observe on control of thyroid nodules in adults, thinking about the superiority of thyroid malignancy in sufferers with thyroid nodules as 15% with a precision of 6% and 95% self-assurance interval, the sample size changed into calculated as 135.

In this take a look at, amongst a hundred thirty five instances, most of the sufferers were among 20-60 years (83%) years of age. mean age of study population for malignancy changed into forty two years and benign lesions have been 30 years. that is similar to the study executed with the aid of Du L et al., wherein the very best share of the thyroid most cancers instances turned into in the 40-fifty nine age corporations. Majority of the sufferers had been ladies, accounting for 6% and the prevalence of thyroid malignancy was better in adult males. This correlated properly with other studies by Nachiappan AC et al., and Ding X et al., which have shown lady predominance inside the occurrence of thyroid nodules. But, the occurrence of thyroid malignancy turned into higher in men than in females (15 out of 60 nodules in adult males were malignant vs nine out of seventy five nodules in females). This finding contradicts GLOBOCAN examine showing that thyroid most cancers accounted for 2.1% of the whole most cancers incidence in 2012, with a global agestandardised incidence rate of four.0 (1.9 in men, 6.1 in girls) in line with one hundred,000 individual-years. This could be defined by the confined wide variety of males inside the observe sample and the overall pattern length which hopefully affected the end result of the have a look at in this respect. In our examine, TIRADS had a sensitivity, specificity and diagnostic accuracy of eighty three%, 96.4% and 94.1%, respectively. research evaluating TIRADS rating to are expecting malignancy confirmed sensitivity varying from as low as 75% to as high as 97%. Specificity became commonly more than ninety five%. This illustrates that TIRADS score is reliable in diagnosing malignancies but now not so true in ruling them out. Unlütürk U et al. confirmed a low sensitivity of 41% and applicable sensitivity of eighty one% even as Russ G verified a specificity of ninety eight.5% however specificity become handiest 44.7%. Zhao CK et al., showed sensitivity varying from 15.7 to 89% and specificity from 58.9 to ninety five.three%. within the present examine, the pressure ratio turned into <2.50 in 112 (eighty three.7%) instances which were benign and ≥2.50 was in 23 (sixteen.3%) instances which was malignant. on this study we assessed the mixed diagnostic performance of SE with TIRADS rating framework and performed sensitivity of 95.eight%, specificity of a hundred%, poor predictive price of 99.1% and accuracy of 99.3%. This turned into advanced to either modality on their very own.

Results: A total of 210 patients with 233 nodules of mean size 2.5 ± 1.5 cm were included. The risk of malignancy of the TIRADS categories were as follows: TIRADS 2 0%, TIRADS 3 2.2%, TIRADS 4A 5.9%, TIRADS 4B 57.9%, TIRADS 5 100%

Conclusions: TIRADS (Thyroid Imaging Reporting and Data System) is a useful diagnostic classification in predicting malignancy and with FNAC using BETHESDA classification, unnecessary surgical procedures can be avoided.