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Hermeneutics for Evaluation of the Diagnostic Value of Ultrasound Elastography in TIRADS 4 Categories of Thyroid Nodules

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Abstract The accurate size cutoff of thyroid nodules for interventional diagnostic purposes still remains a major challenge in Thyroidology like thyroid nodules with indeterminate cytology and/or suspicious sonography, to date. The size cutoff of 10 mm has been well-stablished by recommendations of some guidelines for the thyroid nodules for the purposes of US-guided fine-needle aspiration (US-FNA). Nevertheless, some authors emphasized the "epidemic" of papillary thyroid carcinoma under 10 mm in the largest diameter of the thyroid nodules. In addition, The American Thyroid Association, ATA, Management Guidelines for Adult Patients with Thyroid Nodules and Differentiated Thyroid Cancer recommended US-FNA procedure for thyroid nodules under 5 mm in case of simultaneous existence of lateral cervical lymph node (LCLN) metastasis. Herein, some authors consider the size cutoff of 5 mm for developing LCLN metastases and extrathyroidal extensions. Of note, LCLN metastasis is reported as being more closely observed in papillary thyroid microcarcinomas ≥7 mm than in those under 7 mm. Furthermore, some other studies stated the size cutoff of >7 mm or 8 mm as an independent factor for LCLN metastasis. Herewith, we postulate that so-called thyroid nodules under 10 mm concept selectively might enrich accurate diagnostic purposes of malignancies in Thyroidology.

Keywords: *thyroid gland, shear wave elastography, TI-RADS, indeterminate cytology, Thyroidology*

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Management of thyroid nodules with indeterminate cytology and/or suspicious sonography remains a major challenge for Thyroidology. Herein, the role of ultrasound (US) elastography, *per se*, in this setting is still controversial. [1,2,3] In this sense, Gholami and colleagues [4] intended to cast light on an assessment for the diagnostic performance of shear wave elastography (SWE) alone and in combination with the Thyroid Imaging Reporting and Data System (TI-RADS) with the end of improving the distinction for malignancy in their valuable study. They concluded SWE was being an encouraging test for predicting preoperative malignancy risk in the thyroid nodules with TI-RADS 4. Nevertheless, they specified that the cases with nodules under 10 mm were excluded from the study. The cutoff size of 10 mm has been set by some recommendations for the thyroid nodules on the size selection criteria for US-guided fine-needle aspiration (US-FNA). However, some authors reported the "epidemic" of thyroid cancer was being mainly due to the small papillary thyroid carcinoma (PTC), of which 43-49 % was ≤10 mm. The American Thyroid Association (ATA) Management Guidelines for Adult Patients with Thyroid Nodules and Differentiated Thyroid Cancer was recommended US-FNA for thyroid nodules under 5 mm in case of simultaneous existence of lateral cervical lymph node (LCLN) metastasis. Furthermore, it was declared that the papillary thyroid microcarcinomas (PTmCs) with the size of ≤5 mm, comprise 59.6 % of PTmCs underwent the surgery in Japan and 62 % of those in Italy. In addition, the PTmCs ≤6 mm are 61.8 % of PTmCs operated in Italy and 61.7 % of those in the United States. Of note, some authors consider the size cutoff of 5 mm for developing LCLN metastases and extrathyroidal extensions [5]. Moon et al. [6] emphasized that the immediate surgery for cases with a thyroid malignancy ≤5 mm did not warrant possess any recurrence or zero mortality. Last but not least, LCLN metastasis is reported as being more frequently found in PTmC ≥7 mm than in those under 7 mm. Besides, the size cutoff of >7 mm or 8 mm is an independent factor for LCLN metastasis as stated by the other studies. [6] Herewith, did incorporate the thyroid nodules under 10 mm, instead of excluding them, in Gholami and colleagues' [4] study essential? Therefore, could it change the mentioned study design and the relevant possible

outcomes? As a matter of fact that this issue merits further investigation. In addition, Gholami et al. [4] pointed out the FNA was performed for all the nodules and 39 (70.9%) were benign and 16 (29.1%) were malignant or suspicious for malignancy, were referred for surgery. Among the malignant lesions, eight (50%) cases were PTC, six (37.5%) follicular thyroid carcinoma, while two (12.5%) were medullary thyroid carcinoma. To this end, they proclaimed the descriptions of "pathology result" and "histology result" for them in the study. However, as far as I have understood, should it be "FNA cytology or cytopathology" and "histopathology", respectively? We thank Gholami et al. [4] for their valued study.

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