

## The value of Tc-99m tetrofosmin thyroid scintigraphy in patients with nodular goiter

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The aim of this study is to investigate the value of Tc-99m tetrofosmin (Tc-99m-TF) in conjunction with conventional Tc-99m-pertechnetate (Tc-99m-P) scintigraphy in the differentiation of malignant nodules from benign thyroid nodules. Forty-two patients [(32 females, 10 males; mean age  $41 \pm 13$  years; twenty-two multinodular goiter (MNG) patients with 58 nodules and 20 solitary thyroid nodules (STN)] were included in the study. Thyroid scintigraphy with Tc-99m-P and Tc-99m-TF, thyroid ultrasonography and fine needle aspiration cytology (FNAC) were performed. After IV injection of 370–550 MBq Tc-99m-TF, images were obtained at 15 minutes and evaluated semiquantitatively by using a five point (0–4) scoring system. Four patients with a hypoactive STN, and 1 patient with a hypoactive MNG was found to have thyroid malignancy by histopathological examination; 2 of these patients had false negative benign FNAC results. The tetrofosmin uptake score (TUS) was 2-3-3-3 and 3 in these 5 malignant nodules. Five hyperactive (hot or warm) STN with benign FNAC had a TUS of 2-3-3-3-3. All hypoactive (cold) MNG nodules with benign FNAC ( $n = 21$ ) had  $TUS \leq 2$ . Our preliminary results suggest that follicular adenomas and thyroid cancers have higher tetrofosmin uptake than benign colloid goiter nodules. Mitochondrial sequestration of tetrofosmin in benign or malignant follicular cells that proliferate more rapidly than normal follicular cells and/or hypervascularity may be responsible for this. The use of Tc-99m-TF in conjunction with Tc-99m-P thyroid scintigraphy will be helpful in the evaluation of patients with nodular goiter (NG). In patients with a STN, a hypoactive nodule with a high TUS has a higher probability of malignancy; whereas a hyperactive nodule with a high TUS is a follicular adenoma. In patients with MNG, a hypoactive nodule with a high TUS may be suggestive of malignancy despite a benign FNAC result. We think that further studies with Tc-99m-TF are required to confirm these results.

**Key words:** nodular goiter, thyroid cancer, technetium-99m tetrofosmin thyroid scintigraphy