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### Evaluation of Diagnostic Role of 99mTc-Tetrofosmin Scintigraphy in Cold Thyroid Nodules

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#### Abstract:

**Introduction:** Various radiopharmaceuticals, including  $^{67}\text{Ga}$ ,  $^{201}\text{Tl}$ , and  $^{99\text{m}}\text{Tc}$ -sestamibi have been used to differentiate benign from malignant thyroid nodules.  $^{99\text{m}}\text{Tc}$ -Tetrofosmin, a lipophilic cationic radiotracer, and  $^{99\text{m}}\text{Tc}$ -sestamibi have also been reported to accumulate in thyroid tumors. In this study, we evaluated the role of  $^{99\text{m}}\text{Tc}$ -Tetrofosmin in the differentiation of malignant from benign thyroid nodules. **Methods:** We prospectively studied 108 patients with solitary cold thyroid nodule on  $^{99\text{m}}\text{Tc}$ -pertechnetate scintigraphy (33 malignant and 75 benign) to investigate the diagnostic value of  $^{99\text{m}}\text{Tc}$ -Tetrofosmin scintigraphy.  $^{99\text{m}}\text{Tc}$ -Tetrofosmin scintigraphy was performed 15, 60, and 120 minutes following IV injection of 20 mCi (740 MBq) of radiotracer in the anterior planar mode with a gamma camera equipped with LEAP collimator. The scans were visually analyzed by two experienced nuclear physician. The nodules with late tracer retention (activity more than adjacent thyroid tissue) were classified as positive and nodules without late retention were interpreted as negative for malignancy. Fine needle aspiration (FNA) was performed in all patients in 3-7 days interval. 52 patients were subsequently operated on while 56 patients refused surgery. These 56 patients, however, had at least two negative FNA results. **Results:** 45 out of 108 nodules show high  $^{99\text{m}}\text{Tc}$ -Tetrofosmin uptake on delayed images; 27 of them were malignant. Sensitivity, specificity, positive predictive value, and negative predictive value were calculated to be 81.8%, 76.0%, 54.0%, and 90.4% respectively. Accuracy of the test was also determined to be 77.7%. **Conclusion:** We concluded that  $^{99\text{m}}\text{Tc}$ -Tetrofosmin scintigraphy is a relatively sensitive, but not enough specific, method in diagnosing malignant thyroid nodules. This agent could be of value in the presence of FNA limitations.

#### Keywords:

[Scintigraphy](#) . [Malignancy](#) . [99m Tc-Tetrofosmin](#) . [Cold nodule of thyroid](#)

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