

Clinical importance of technetium-99m-methoxyisobutylisonitrile (MIBI) scintigraphy in differentiated thyroid carcinoma patients with elevated thyroglobulin levels and negative I-131 scanning results

Nuriye Özlem KÜÇÜK, Hülya Atalay KULAK and Gülseren ARAS

Department of Nuclear Medicine, Ankara University Faculty of Medicine, Ankara, Turkey

Aims and Background: The aim of this study was to evaluate the potential contribution of Tc-99m-MIBI scintigraphy to the follow-up of patients with differentiated thyroid carcinoma, who had elevated Tg levels and negative I-131 whole-body scan results. **Materials and Methods:** In this retrospective study, we evaluated 28 patients with differentiated thyroid carcinoma, who had total or near total thyroidectomy followed by an ablative dose of I-131 at various time intervals (15 women, 13 men; mean age 43 ± 17 years). All patients were treated with T4 suppression. After a mean follow-up period of 6.1 years (range 3–15) all patients were determined to have a high serum Tg concentrations (>2 ng/ml) and previous negative I-131 WBS results. All patients were examined for metastatic sites using Tc-99m-MIBI scan. Scans were visually evaluated for detecting lymph node metastases and/or local recurrence, lung metastases and skeletal metastases. **Results:** Tc-99m-MIBI scan demonstrated lesions in 23 patients (83.3%). In five patients with negative Tc-99m-MIBI scan findings (FN results):

* Chest CT showed small-sized mediastinal LN metastases in 2 patients and lung metastases in another 2 patients (<1 cm).

* Neck CT showed small-sized cervical LN involvement in 1 patient.

The sensitivity of detection for neck was 94.4%, for lung 63.6%, and for bone lesions 100%. For all scan sites taken together, the sensitivity of disease detection was 83.3%, the specificity was 50%, positive predictive value (PPV) was 96.2%, and finally negative predictive value (NPV) was 16.7%. **Conclusion:** We concluded that Tc-99m-MIBI scan should be considered as a supplementary scintigraphic method for the follow-up of patients with high serum Tg levels and negative I-131 WBS results, and it can help clinicians in making the decision to treat these patients.

Key words: Tc-99m-MIBI, I-131 whole body scan, serum thyroglobulin, differentiated thyroid carcinoma