**ORIGINAL ARTICLE**

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# Brain metastasis from differentiated thyroid cancer in patients treated with radioiodine for bone and lung lesions

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Brain metastasis of differentiated thyroid cancer (DTC) often is detected during treatment of other remote lesions. We examined the prevalence, risk factors and treatment outcome of this disease encountered during nuclear medicine practice. Of the 167 patients with metastasis to lung or bone treated 1–14 times with radioactive iodine (RAI), 9 (5.4%) also had lesions in the brain. Five were males and 4 females, aged 49–84, out of the original population of 49 males and 118 females aged 10–84 (mean 54.7) years. Three of them underwent removal of their brain tumors, 5 received conventional external beam irradiation, and 2 had stereotactic radiosurgery with supervoltage X-ray. None of the brain lesions showed significant uptake of RAI despite demonstrable accumulation in most extracerebral lesions. Seven patients died 4–23 (mean 9.4) months after the discovery of cerebral metastasis, brain damage being the primary or at least a contributing cause. The 8th and 9th patients remained relatively well for more than 42 and 3 months, respectively, without any evidence of intracranial recurrence. Our results confirmed that the brain is a major site of secondary metastasis from DTC. No statistically significant demographic risk factor was detected. Any suspicious neurological symptoms in the course of RAI treatment warrant cerebral computed tomography. As for therapy, from our initial experience, radiosurgery seemed promising as an effective and less invasive alternative to surgical removal.

**Key words:** thyroid cancer, radioiodine treatment, brain metastasis, bone metastasis, lung metastasis