European Journal of Nuclear Medicine and Molecular Imaging (2023) 50:1833–1834
https://doi.org/10.1007/s00259-022-06061-8

IMAGE OF THE MONTH

Successful combination of selpercatinib and radioiodine after pretherapeutic dose estimation in RET-altered thyroid carcinoma

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Received: 1 November 2022 / Accepted: 24 November 2022 / Published online: 16 December 2022

We report on a patient affected with rearranged during transfection (RET) fusion positive papillary thyroid carcinoma (TC). After thyroidectomy and radioiodine treatment (RIT), follow-up 123I scintigraphy did not show uptake in lung nodules identified on CT (A, arrows), indicating radioactive iodine (RAI) refractory TC. Upon disease progression, the patient received the selective RET inhibitor (RETi) selpercatinib as part of an expanded access program. Diagnostic whole-body 131I scan was conducted after 15.5 months of RETi, showing intense radiotracer accumulation in sites of disease (retention after 45 h, 0.24% of the administered activity per gram of tissue mass). After RAI with 9.4 GBq, previously negative lung nodules showed intense radiotracer accumulation on post-therapeutic scan (B). Thirteen days after therapy, a peak of Tg of 2.224 ng/ml was observed, followed by a rapid decline, suggestive of tumor response (C). Eight months after first RIT, Tg dropped from baseline 148 ng/ml under TSH suppression to 21 ng/ml with CT demonstrating reduction of lung nodules (D, arrows). Another RIT using 7.5 GBq of RAI was conducted 5 months later.

Using a fixed activity of 3.7 GBq RAI, a previous case reported on treatment failure after 6 months [1]. We herein report on selpercatinib-triggered redifferentiation combined with pre-therapeutic dose estimation to increase therapeutic efficacy of RAI. This individualized approach allowed us to administer substantially higher activities (achieving tumor doses of 197 Gy). Thus, dosimetry-adjusted RAI doses may further increase anti-tumor effects, e.g., in pediatrics [2, 3].

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This article is part of the Topical Collection on Endocrinology.

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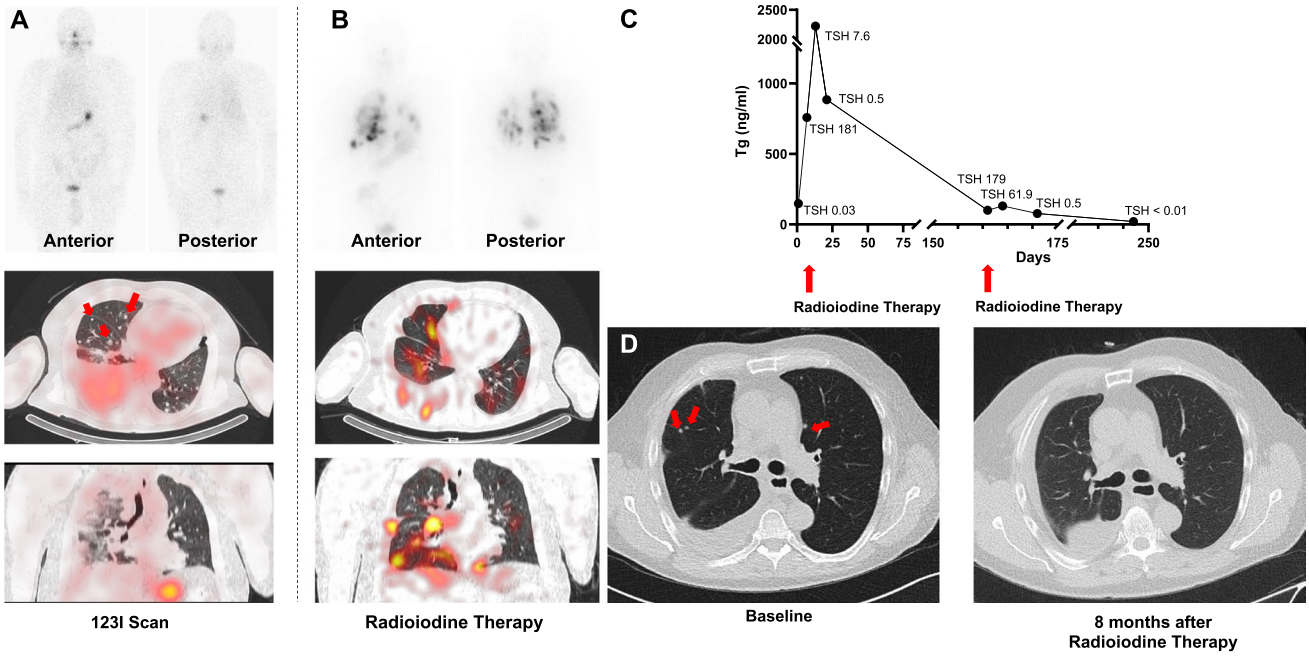

Funding Open Access funding enabled and organized by Projekt DEAL.

Data Availability Analyzed datasets are available from the corresponding author on reasonable request.

Declarations

Consent to participate Written informed consent was obtained.

Conflict of interest The authors declare no competing interests.

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