A Rare Case of Isolated Pericardial Effusion Detected by SPECT/CT on a Post-Therapeutic Radioiodine Whole-Body Scan

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Abstract We reported a rare finding of isolated pericardial uptake detected by SPECT/CT on posttherapeutic radioiodine whole body scan. This case highlights the usefulness of hybrid SPECT/CT, with subsequent correlation with biochemical results, in ruling out metastatic pericardial effusion in the postsurgical radioiodine remnant ablation setting. The effusion was resolved after reinstituted thyroid replacement therapy. Recombinant thyrotropin is recommended to avoid such rare but life-threatening complication.

Keywords Pericardial effusion · SPECT/CT · Whole body imaging

A 22-year-old male was referred for radioiodine remnant ablation after total thyroidectomy for papillary thyroid carcinoma. Four weeks after L-thyroxine withdrawal, he received 3.7 GBq of radioiodine. Prior to radioiodine administration, his serum thyroxine (T4) and thyroid stimulating hormone (TSH) values were <0.3 pmol/l (12.0–22.0) and >300 mU/l (0.27–4.2), respectively (Fig. 1).

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Fig. 1 A post-therapeutic whole-body scan on day 5 showed a halo sign in the pericardiac region; no other activity was noted in the rest of the body (a). Subsequent single-photon emission computed tomography/computed tomography (SPECT/CT) fusion images confirmed isolated tracer uptake in the pericardial effusion. The pericardial effusion was moderate without pericardial thickening or nodules (b, c). Hypothyroidism-related pericardial effusion was diagnosed on the basis of the scan findings, taking into account of the high levels of serum TSH. As he was hemodynamically stable, diagnostic and therapeutic pericardiocentesis was withheld on the condition that his clinical progress was closely monitored with immediate L-thyroxine retreatment, pending the thyroglobulin (Tg) level results. It later emerged that his Tg was <1.0 ug/l with negative anti-Tg antibody, ruling out the

possibility of a metastatic effusion. Six weeks later, echocardiography showed complete regression of the effusion (d). This case demonstrates an unusual isolated pericardial effusion secondary to thyroxine withdrawal-related hypothyroidism, which can occur rapidly over a short period of time [1–3]. Cardiac tamponade is a rare complication but has previously been reported [4, 5]. To avoid this rare but life-threatening complication, recombinant thyrotropin is recommended to replace thyroid hormone withdrawal prior to thyroid remnant ablation. This case also highlights the usefulness of hybrid SPECT/CT, with subsequent correlation with biochemical results, in ruling out metastatic pericardial effusion in the postsurgical radioiodine remnant ablation setting

Conflict of Interest Teik Hin Tan and Siti Zarina Amir Hassan declare that they have no conflict of interest.

Ethics Statement Informed consent was obtained from the patient. This case report was approved by the local ethics committee.

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