Dual-energy computed tomography (DECT) can acquire two data sets showing different attenuation levels allowing collection of additional information about the elementary chemical composition of the scanned material. Color can then be assigned according to the 80- and 140-kV computed tomography (CT) values to obtain a color-mapped, dual-energy image. DECT has been used extensively in our department in postmortem CT with excellent results (1). One of the advantages of DECT is that iodine contrast uptake in soft tissue can be quantified. We were wondering about its ability to localize parathyroid adenomas (PAs).

A 61-yr-old woman underwent bilateral cervical exploration for primary hyperparathyroidism. On the left side, two normal parathyroid glands (PGs) were identified right next to the thyroid gland. On the right side, the slightly enlarged lower PG was removed (histologically normal). The upper PG was not found. Her postoperative PTH and ionized serum (S)-calcium remained elevated. The patient underwent CT and methoxyisobutylisonitrile (MIBI)-scintigraphy (Fig. 1Ai), both considered negative. Methionine-positron emission tomography showed in agreement with the missing PG a suspected intrathyroidal PA on the right side (Fig. 1Aii). After reoperation, the intrathyroidal nodule proved to be a lymph node, the lower (Fig. 1Aii) histologically proved to be a PA. PTH and ionized S-calcium normalized (31 pg/ml and 1.27 mmol/liter, respectively) and remained normal within the observation period. More than 1 yr after operation, the patient is symptom free.

This is the first report on an ectopic PA localized by DECT. The real clinical impact of DECT concerning localization of (ectopic) PAs needs to be proved in further studies.

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Reference


Abbreviations: CT, Computed tomography; DECT, dual-energy CT; PA, parathyroid adenoma; PG, parathyroid gland; S, serum.
FIG. 1. A, Imaging techniques and selective venous sampling before DECT. Ai, Methoxyisobutylisonitrile (MIBI) (false-negative). Aii, Methionine-positron emission tomography, suggestive for a right intrathyroidal PA (red arrow, false-positive). Aiii, Selective venous sampling, suggestive for a left lower PA (final localization of the PA; red oval). B, DECT and reevaluation of the conventional CT after DECT. Bi and Bii, DECT identifying two structures ventrally of left internal jugular vein at the height of the left upper thyroid pole and above thereof. The upper structure (yellow arrow) turned out to be a lymph node, the lower (green arrow) proved to be a PA. Biii, Reevaluation of the conventional CT showed a previously misinterpreted structure at the same position (green arrow). C, Intraoperative situs and specimen. Ci, Intraoperative situs, the caudal part of the two structures, i.e. the PA (green arrow) is lifted with forceps (yellow arrow, lymph node; blue arrow, internal jugular vein). Cii, Removed specimen with lymph node on the right (yellow arrow) and PA on the left (green arrow). Ciii, PA after longitudinal incision showing typical parathyroid tissue later confirmed histologically (lymph node removed).