Hyperplasia of all four parathyroid glands in renal failure visualized by Tc-99m tetrofosmin scintigraphy

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Renal history

A 21-year-old woman had been on haemodialysis since 1994. Renal failure was caused by reflux nephropathy and recurrent urinary infections secondary to obstructive uropathy. She underwent bilateral nephrectomy in 1995 and received a cadaver renal transplant in 1996. One year later, the graft was removed following renal artery occlusion.

Parathyroid gland history

Secondary hyperparathyroidism was diagnosed in 1994. Following the renal transplant, the parathyroid gland function became normal. In 1998 her intact PTH level in serum on three occasions ranged from 2482 to 4127 pg/ml (normal range 15–60 pg/ml). Technetium-99m (Tc-99m) tetrofosmin parathyroid scintigraphy showed abnormal focal areas of increased uptake in each of the four thyroid poles. These areas were not visualized by Tc-99m pertechnetate, suggesting four hyperplastic parathyroid glands (Figure 1). Subsequently at parathyroidectomy four glands, each measuring 1.2–1.3 cm, were identified at the four poles of the thyroid, and histology showed ‘nodular and diffuse hyperplasia of chief cells’.

Discussion

Tc-99m tetrofosmin parathyroid imaging is a useful method for localizing abnormal glands in patients with primary and secondary hyperparathyroidism [1–3]. With hyperplastic parathyroid glands tetrofosmin imaging gives an overall sensitivity of 84% and a specificity of 75%, higher than those of Tc-99m sestamibi, ultrasonography and magnetic resonance imaging [1–2]. The former has demonstrated a low sensitivity for localization of hyperplastic glands in secondary hyperparathyroidism (31%) [3].

Four ectopic hyperplastic parathyroid glands have been diagnosed by Tc-99m sestamibi [4], and thallium-technetium subtraction scanning has localized four ‘eutopic’ hyperplastic glands [5]. Hyperplasia of all four eutopic parathyroid glands has only rarely been visualized and, to our knowledge, this is the first case visualized by Tc-99m tetrofosmin. The inconvenience of other imaging techniques (low sensitivity for detection of glands and deficiency with regard to prediction of multiple parathyroid involvement) has not been encountered with Tc-99m tetrofosmin in this patient.

References


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Fig. 1. (A) Tc-99m pertechnetate pinhole image of the thyroid in the anterior view was performed for visual comparison when reading the tetrofosmin image. (B) Neck and mediastinum pinhole image obtained 10 min after injection of Tc-99m tetrofosmin showed an abnormal focal area of increased uptake in every thyroid pole, visualized with tetrofosmin and not with pertechnetate, corresponding to hyperplasia of all four parathyroid glands.