Annals of Nuclear Medicine Vol. 6, No. 3, 185–190, 1992

# Localization of hyperfunctioning parathyroid glands by means of thallium-201 and iodine-131 subtraction scintigraphy in patients with primary and secondary hyperparathyroidism

Mitsuko SUEHIRO and Minoru FUKUCHI

*Department of Nuclear Medicine, Hyogo College of Medicine, Nishinomiya, Hyogo, Japan*

The accuracy of the preoperative localization of hyperfunctioning parathyroid glands by subtraction scintigraphy with $^{201}Tl$ and $^{131}I$ was evaluated by comparison with the operative findings. The subjects were 67 consecutive patients with hyperparathyroidism (HPT), including 24 with primary and 43 with secondary HPT. In primary HPT, surgery revealed 26 adenomas weighing 0.26–15.80 g (mean$\pm$SD; 3.01$\pm$3.04 g). Two patients had double adenomas. Scintigraphy correctly localized 25/26 adenomas (96.2%) in primary HPT for a sensitivity, specificity, and accuracy of 96.2%, 98.5%, and 97.9%, respectively. In secondary HPT, 163 hyperplastic glands weighing 0.03–5.08 g (0.85$\pm$0.93 g) were found. Scintigraphy correctly localized 79 glands (48.5%) weighing 0.03–5.08 g (1.19$\pm$1.10 g), but 84 glands (51.5%) weighing 0.04–2.70 g (0.51$\pm$0.50 g) were not detected. Thus, the sensitivity, specificity, and accuracy of scintigraphy were respectively 48.5%, 100%, and 51.2%, in secondary HPT. These results show that scintigraphy with $^{201}Tl$ and $^{131}I$ can be used to locate abnormal parathyroid glands with an efficacy equal to or better than that of the conventional methods with $^{201}Tl$ and $^{99m}Tc$ or $^{201}Tl$ and $^{123}I$.

**Key words:** subtraction scintigraphy, parathyroid gland, $^{131}I$, $^{201}Tl$, hyperparathyroidism