

## Usefulness of dual-head coincidence gamma camera with thick NaI crystals for nuclear oncology: Comparison with dedicated PET camera and conventional gamma camera with thin NaI crystals

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**Aim:** A comparative study of the images obtained with a dual-head coincidence gamma camera with thick NaI crystals (19 mm), a dedicated PET camera with BGO crystals and a conventional gamma camera with thin NaI crystals (9.5 mm) was conducted to clarify the clinical feasibility of a dual-head coincidence gamma camera with thick NaI crystals. **Methods:** FDG images of 27 patients with malignant tumors were obtained by means of a dual-head coincidence gamma camera with thick NaI crystal and a dedicated PET camera with BGO crystals. The images of bone scintigraphy in 10 cancer patients obtained with the dual-head coincidence gamma camera were compared with those taken by a conventional dual-head gamma camera with thin NaI crystals. **Results:** Patient-basis sensitivity in 27 patients with neoplasms and lesion-basis sensitivity of the dual-head coincidence gamma camera and the dedicated PET camera were 74.1% and 85.2% (n.s.), 66.7% and 72.2% (n.s.), respectively. The tumor to background FDG uptake ratio derived from the coincidence gamma camera was significantly lower than that derived from the dedicated PET camera (mean  $\pm$  s.d.;  $3.48 \pm 3.77$  vs.  $8.12 \pm 8.92$ ,  $p < 0.0001$ ), but the tumor to background FDG uptake ratio obtained with both methods correlated well ( $r = 0.84$ ,  $p < 0.001$ ). Similar whole body bone scans were obtained with the dual-head coincidence gamma camera and the conventional dual-head gamma camera in all 10 patients. **Conclusion:** These results suggest that the dual-head coincidence gamma camera with thick NaI crystals has potentially high clinical applicability for community hospitals.

**Key words:** PET, SPECT, malignant tumor, FDG, coincidence gamma camera